



# Catalyst 6500 Series DFC3A, DFC3B, and DFC3BXL Installation Note

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**Product numbers:** WS-F6700-DFC3A(=), WS-F6700-DFC3B(=), WS-F6700-DFC3BXL(=)

This publication contains the procedures for installing the Distributed Forwarding Card 3 (DFC3) on Ethernet modules. The three versions of the DFC daughter card: DFC3A, DFC3B, or DFC3BXL can be installed on the following Catalyst 6500 series modules:

- WS-X6704-10GE
- WS-X6724-SFP
- WS-X6748-SFP
- WS-X6748-GE-TX



## Note

Throughout this publication, unless otherwise noted, the term DFC3 daughter card refers to the DFC3A, DFC3B, and DFC3BXL daughter cards.



## Caution

Some WS-X6748-GE-TX Ethernet modules are equipped with a stiffener bracket that extends across the top of the front row of chips on the module. Alternate procedures are provided in this document that cover the removal and the replacement of the DFC daughter card on modules equipped with the stiffener bracket. You must follow these alternate procedures when upgrading a WS-X6748-GE-TX equipped with a stiffener bracket; otherwise, you can seriously damage the DFC daughter card.

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## Installation Requirements and Guidelines

To install and use the DFC3 daughter card, you need the following:

- Catalyst 6500 series switch or Cisco 7600 series router
- Supervisor Engine 720 with an MSFC3 running Cisco IOS software on both the Supervisor Engine 720 and the MSFC3
- The WS-F6700-DFC3A, WS-F6700-DFC3B, and WS-F6700-DFC3BXL daughter cards can be installed only on the following Catalyst 6500 series modules:
  - WS-X6704-10GE
  - WS-X6724-SFP
  - WS-X6748-SFP
  - WS-X6748-GE-TX
- Observe the restrictions listed in [Table 1](#) for PFC3/DFC3 mismatch.

**Table 1**      **PFC3/DFC3 Operating Restrictions**

<b>PFC Version</b>	<b>DFC Version</b>	<b>Restrictions</b>
PFC3A	DFC3A	No restrictions.
	DFC3B	The DFC3B functions as a DFC3A.
	DFC3BXL	The DFC3BXL functions as a DFC3A.
PFC3B	DFC3A	You must reset the system after installing a DFC3A-equipped module. The PFC3B functions as a PFC3A.
	DFC3B	No restrictions.
	DFC3BXL	The DFC3BXL functions as a DFC3B.
PFC3BXL	DFC3A	You must reset the system after installing a DFC3A-equipped module. The PFC3BXL functions as a PFC3A.
	DFC3B	You must reset the system after installing a DFC3B-equipped module. The PFC3BXL functions as a PFC3B.
	DFC3BXL	No restrictions.

## Safety Overview

Safety warnings appear throughout this publication in procedures that, if performed incorrectly, may harm you. A warning symbol precedes each warning statement.

## Statement 1071—Warning Definition



Warning

### IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

### SAVE THESE INSTRUCTIONS

Waarschuwing

### BELANGRIJKE VEILIGHEIDSINSTRUCTIES

Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van de standaard praktijken om ongelukken te voorkomen. Gebruik het nummer van de verklaring onderaan de waarschuwing als u een vertaling van de waarschuwing die bij het apparaat wordt geleverd, wilt raadplegen.

### BEWAAR DEZE INSTRUCTIES

Varoitus

### TÄRKEITÄ TURVALLISUUSOHJEITA

Tämä varoitusmerkki merkitsee vaaraa. Tilanne voi aiheuttaa ruumiillisia vammoja. Ennen kuin käsittelet laitteistoa, huomioi sähköpiirien käsittelyyn liittyvät riskit ja tutustu onnettomuuksien yleisiin ehkäisytapoihin. Turvallisuusvaroitusten käännökset löytyvät laitteen mukana toimitettujen käännettyjen turvallisuusvaroitusten joukosta varoitusten lopussa näkyvien lausuntonumeroiden avulla.

### SÄILYTÄ NÄMÄ OHJEET

Attention

### IMPORTANTES INFORMATIONS DE SÉCURITÉ

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

### CONSERVEZ CES INFORMATIONS

**Warnung WICHTIGE SICHERHEITSHINWEISE**

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

**BEWAHREN SIE DIESE HINWEISE GUT AUF.**

**Avvertenza IMPORTANTI ISTRUZIONI SULLA SICUREZZA**

Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di intervenire su qualsiasi apparecchiatura, occorre essere al corrente dei pericoli relativi ai circuiti elettrici e conoscere le procedure standard per la prevenzione di incidenti. Utilizzare il numero di istruzione presente alla fine di ciascuna avvertenza per individuare le traduzioni delle avvertenze riportate in questo documento.

**CONSERVARE QUESTE ISTRUZIONI**

**Advarsel VIKTIGE SIKKERHETSINSTRUKSJONER**

Dette advarselssymbolet betyr fare. Du er i en situasjon som kan føre til skade på person. Før du begynner å arbeide med noe av utstyret, må du være oppmerksom på farene forbundet med elektriske kretser, og kjenne til standardprosedyrer for å forhindre ulykker. Bruk nummeret i slutten av hver advarsel for å finne oversettelsen i de oversatte sikkerhetsadvarslene som fulgte med denne enheten.

**TA VARE PÅ DISSE INSTRUKSJONENE**

**Aviso INSTRUÇÕES IMPORTANTES DE SEGURANÇA**

Este símbolo de aviso significa perigo. Você está em uma situação que poderá ser causadora de lesões corporais. Antes de iniciar a utilização de qualquer equipamento, tenha conhecimento dos perigos envolvidos no manuseio de circuitos elétricos e familiarize-se com as práticas habituais de prevenção de acidentes. Utilize o número da instrução fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham este dispositivo.

**GUARDE ESTAS INSTRUÇÕES**

**¡Advertencia! INSTRUCCIONES IMPORTANTES DE SEGURIDAD**

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

**GUARDE ESTAS INSTRUCCIONES**

**Varning! VIKTIGA SÄKERHETSANVISNINGAR**

Denna varningssignal signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanliga förfaranden för att förebygga olyckor. Använd det nummer som finns i slutet av varje varning för att hitta dess översättning i de översatta säkerhetsvarningar som medföljer denna anordning.

**SPARA DESSA ANVISNINGAR****Figyelem FONTOS BIZTONSÁGI ELOÍRÁSOK**

Ez a figyelmeztető jel veszélyre utal. Sérülésveszélyt rejtő helyzetben van. Mielőtt bármely berendezésen munkát végezte, legyen figyelemmel az elektromos áramkörök okozta kockázatokra, és ismerkedjen meg a szokásos balesetvédelmi eljárásokkal. A kiadványban szereplő figyelmeztetések fordítása a készülékhez mellékelt biztonsági figyelmeztetések között található; a fordítás az egyes figyelmeztetések végén látható szám alapján kereshető meg.

**ORIZZE MEG EZEKET AZ UTASÍTÁSOKAT!****Предупреждение ВАЖНЫЕ ИНСТРУКЦИИ ПО СОБЛЮДЕНИЮ ТЕХНИКИ БЕЗОПАСНОСТИ**

Этот символ предупреждения обозначает опасность. То есть имеет место ситуация, в которой следует опасаться телесных повреждений. Перед эксплуатацией оборудования выясните, каким опасностям может подвергаться пользователь при использовании электрических цепей, и ознакомьтесь с правилами техники безопасности для предотвращения возможных несчастных случаев. Воспользуйтесь номером заявления, приведенным в конце каждого предупреждения, чтобы найти его переведенный вариант в переводе предупреждений по безопасности, прилагаемом к данному устройству.

**СОХРАНИТЕ ЭТИ ИНСТРУКЦИИ****警告 重要的安全性说明**

此警告符号代表危险。您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾提供的声明号码来找到此设备的安全性警告说明的翻译文本。

请保存这些安全性说明

**警告 安全上の重要な注意事項**

「危険」の意味です。人身事故を予防するための注意事項が記述されています。装置の取り扱い作業を行うときは、電気回路の危険性に注意し、一般的な事故防止策に留意してください。警告の各国語版は、各注意事項の番号を基に、装置に付属の「Translated Safety Warnings」を参照してください。

これらの注意事項を保管しておいてください。

**주의**      **중요 안전 지침**

이 경고 기호는 위험을 나타냅니다. 작업자가 신체 부상을 일으킬 수 있는 위험한 환경에 있습니다. 장비에 작업을 수행하기 전에 전기 회로와 관련된 위험을 숙지하고 표준 작업 관례를 숙지하여 사고를 방지하십시오. 각 경고의 마지막 부분에 있는 경고문 번호를 참조하여 이 장치와 함께 제공되는 번역된 안전 경고문에서 해당 번역문을 찾으십시오.

이 지시 사항을 보관하십시오.

**Aviso**      **INSTRUÇÕES IMPORTANTES DE SEGURANÇA**

**Este símbolo de aviso significa perigo. Você se encontra em uma situação em que há risco de lesões corporais. Antes de trabalhar com qualquer equipamento, esteja ciente dos riscos que envolvem os circuitos elétricos e familiarize-se com as práticas padrão de prevenção de acidentes. Use o número da declaração fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham o dispositivo.**

**GUARDE ESTAS INSTRUÇÕES****Advarsel**      **VIGTIGE SIKKERHEDSANVISNINGER**

**Dette advarselssymbol betyder fare. Du befinder dig i en situation med risiko for legemesbeskadigelse. Før du begynder arbejde på udstyr, skal du være opmærksom på de involverede risici, der er ved elektriske kredsløb, og du skal sætte dig ind i standardprocedurer til undgåelse af ulykker. Brug erklæringsnummeret efter hver advarsel for at finde oversættelsen i de oversatte advarsler, der fulgte med denne enhed.**

**GEM DISSE ANVISNINGER****تحذير****إرشادات الأمان الهامة**

يوضح رمز التحذير هذا وجود خطر. وهذا يعني أنك متواجد في مكان قد ينتج عنه التعرض لإصابات. قبل بدء العمل، احذر مخاطر التعرض للصدمات الكهربائية وكن على علم بالإجراءات القياسية للحيولة دون وقوع أي حوادث. استخدم رقم البيان الموجود في آخر كل تحذير لتحديد مكان ترجمته داخل تحذيرات الأمان المترجمة التي تأتي مع الجهاز. قم بحفظ هذه الإرشادات

**Upozorenje**      **VAŽNE SIGURNOSNE NAPOMENE**

Ovaj simbol upozorenja predstavlja opasnost. Nalazite se u situaciji koja može prouzročiti tjelesne ozljede. Prije rada s bilo kojim uređajem, morate razumjeti opasnosti vezane uz električne sklopove, te biti upoznati sa standardnim načinima izbjegavanja nesreća. U prevedenim sigurnosnim upozorenjima, priloženima uz uređaj, možete prema broju koji se nalazi uz pojedino upozorenje pronaći i njegov prijevod.

**SAČUVAJTE OVE UPUTE**

**Upozornění DŮLEŽITÉ BEZPEČNOSTNÍ POKYNY**

**Tento upozorňující symbol označuje nebezpečí. Jste v situaci, která by mohla způsobit nebezpečí úrazu. Před prací na jakémkoliv vybavení si uvědomte nebezpečí související s elektrickými obvody a seznamte se se standardními opatřeními pro předcházení úrazům. Podle čísla na konci každého upozornění vyhledejte jeho překlad v přeložených bezpečnostních upozorněních, která jsou přiložena k zařízení.**

**USCHOVEJTE TYTO POKYNY****Προειδοποίηση ΣΗΜΑΝΤΙΚΕΣ ΟΔΗΓΙΕΣ ΑΣΦΑΛΕΙΑΣ**

Αυτό το προειδοποιητικό σύμβολο σημαίνει κίνδυνο. Βρίσκεστε σε κατάσταση που μπορεί να προκαλέσει τραυματισμό. Πριν εργαστείτε σε οποιοδήποτε εξοπλισμό, να έχετε υπόψη σας τους κινδύνους που σχετίζονται με τα ηλεκτρικά κυκλώματα και να έχετε εξοικειωθεί με τις συνήθειες πρακτικές για την αποφυγή ατυχημάτων. Χρησιμοποιήστε τον αριθμό δήλωσης που παρέχεται στο τέλος κάθε προειδοποίησης, για να εντοπίσετε τη μετάφρασή της στις μεταφρασμένες προειδοποιήσεις ασφαλείας που συνοδεύουν τη συσκευή.

**ΦΥΛΑΞΤΕ ΑΥΤΕΣ ΤΙΣ ΟΔΗΓΙΕΣ****אזהרה****הוראות בטיחות חשובות**

סימן אזהרה זה מסמל סכנה. אתה נמצא במצב העלול לגרום לפציעה. לפני שתעבוד עם ציוד כלשהו, עליך להיות מודע לסכנות הכרוכות במעגלים חשמליים ולהכיר את הנהלים המקובלים למניעת תאונות. השתמש במספר ההוראה המסופק בסופה של כל אזהרה כדי לאתר את התרגום באזהרות הבטיחות המתורגמות שמצורפות להתקן.

**שמור הוראות אלה****Opomena****ВАЖНИ БЕЗБЕДНОСНИ НАПАТСТВИЈА**

Симболот за предупредување значи опасност. Се наоѓате во ситуација што може да предизвика телесни повреди. Пред да работите со опремата, бидете свесни за ризикот што постои кај електричните кола и треба да ги познавате стандардните постапки за спречување на несреќни случаи. Искористете го бројот на изјавата што се наоѓа на крајот на секое предупредување за да го најдете неговиот период во преведените безбедносни предупредувања што се испорачани со уредот.

**ЧУВАЈТЕ ГИ ОВИЕ НАПАТСТВИЈА**



**Ostrzeżenie WAŻNE INSTRUKCJE DOTYCZĄCE BEZPIECZEŃSTWA**

Ten symbol ostrzeżenia oznacza niebezpieczeństwo. Zachodzi sytuacja, która może powodować obrażenia ciała. Przed przystąpieniem do prac przy urządzeniach należy zapoznać się z zagrożeniami związanymi z układami elektrycznymi oraz ze standardowymi środkami zapobiegania wypadkom. Na końcu każdego ostrzeżenia podano numer, na podstawie którego można odszukać tłumaczenie tego ostrzeżenia w dołączonym do urządzenia dokumencie z tłumaczeniami ostrzeżeń.

**NINIEJSZE INSTRUKCJE NALEŻY ZACHOWAĆ**

**Upozornenie DÔLEŽITÉ BEZPEČNOSTNÉ POKYNY**

Tento varovný symbol označuje nebezpečenstvo. Nachádzate sa v situácii s nebezpečenstvom úrazu. Pred prácou na akomkoľvek vybavení si uvedomte nebezpečenstvo súvisiace s elektrickými obvodmi a oboznámte sa so štandardnými opatreniami na predchádzanie úrazom. Podľa čísla na konci každého upozornenia vyhľadajte jeho preklad v preložených bezpečnostných upozorneniach, ktoré sú priložené k zariadeniu.

**USCHOVAJTE SI TENTO NÁVOD**



**Warning**

**Only trained and qualified personnel should be allowed to install, replace, or service this equipment.**  
Statement 1030



**Warning**

**Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.** Statement 1034

## Required Tools and Parts

These parts are included in the DFC3 daughter card upgrade kit:

- The DFC3A, DFC3B, or DFC3BXL daughter card
- Installation bracket and mounting hardware (mounts over the male standoffs at the rear of the DFC daughter card)
- One disposable grounding wrist strap
- One MEM-XCEF720-1GB memory upgrade



**Note**

The MEM-XCEF720-1GB memory upgrade is required for the DFC3BXL upgrade only and is included as part of the DFC3BXL daughter card kit only.

These tools and supplies are required to remove and install the DFC3 daughter card:

- Antistatic mat or foam pad to support the removed module and an antistatic bag to store the removed Central Forwarding Card (CFC) or DFC daughter card
- Your own ESD-prevention equipment or the disposable grounding wrist strap included in the upgrade kit
- Number 1 Phillips-head screwdriver for the DFC daughter card installation hardware

## Removing a CFC or DFC Daughter Card

If your module has either a CFC or a DFC daughter card installed, you must remove the daughter card before installing the new DFC daughter card. Two procedures are provided: See either the [“Removing the CFC Daughter Card” section on page 10](#) or [“Removing the DFC3 Daughter Card from Modules Without Stiffener Brackets” section on page 13](#).

### Removing the CFC Daughter Card

To remove a CFC daughter card, follow these steps:

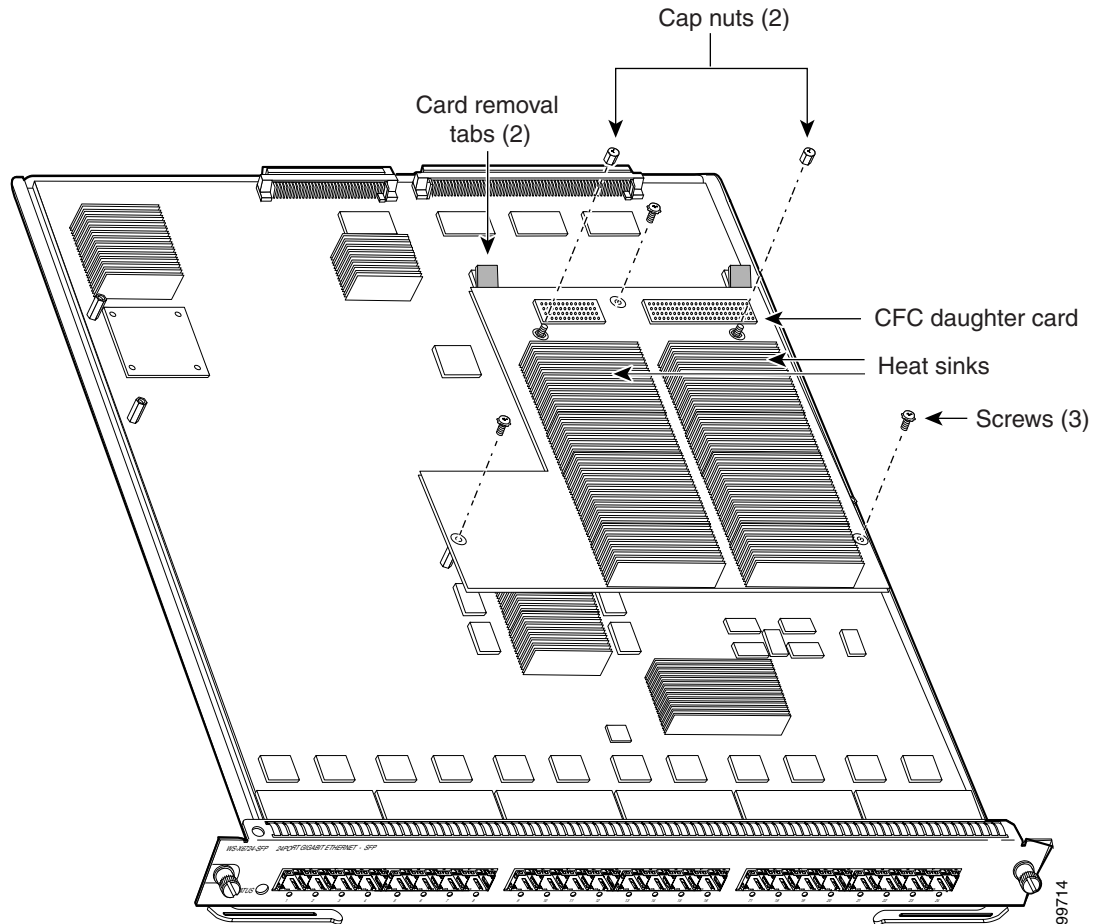


#### Warning

**During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 94

- Step 1** Attach an ESD grounding strap to your wrist and to ground. (If you are unsure about the correct way to attach an ESD grounding strap, refer to the [“Attaching Your ESD Grounding Strap” section on page 40](#) for instructions.)
- Step 2** Remove the Ethernet module from the Catalyst 6500 series switch. (If you are unsure about the correct procedure for removing a module from the switch chassis, refer to the [“Removing and Installing Modules in the Chassis” section on page 32](#) for removal instructions.)
- Step 3** Place the Ethernet module on an antistatic mat with the front of the module facing toward you.
- Step 4** Use a Phillips-head screwdriver to remove the three securing screws and the two cap nuts. (See [Figure 1](#).)

**Figure 1** CFC Daughter Card Securing Screws and Cap Nuts



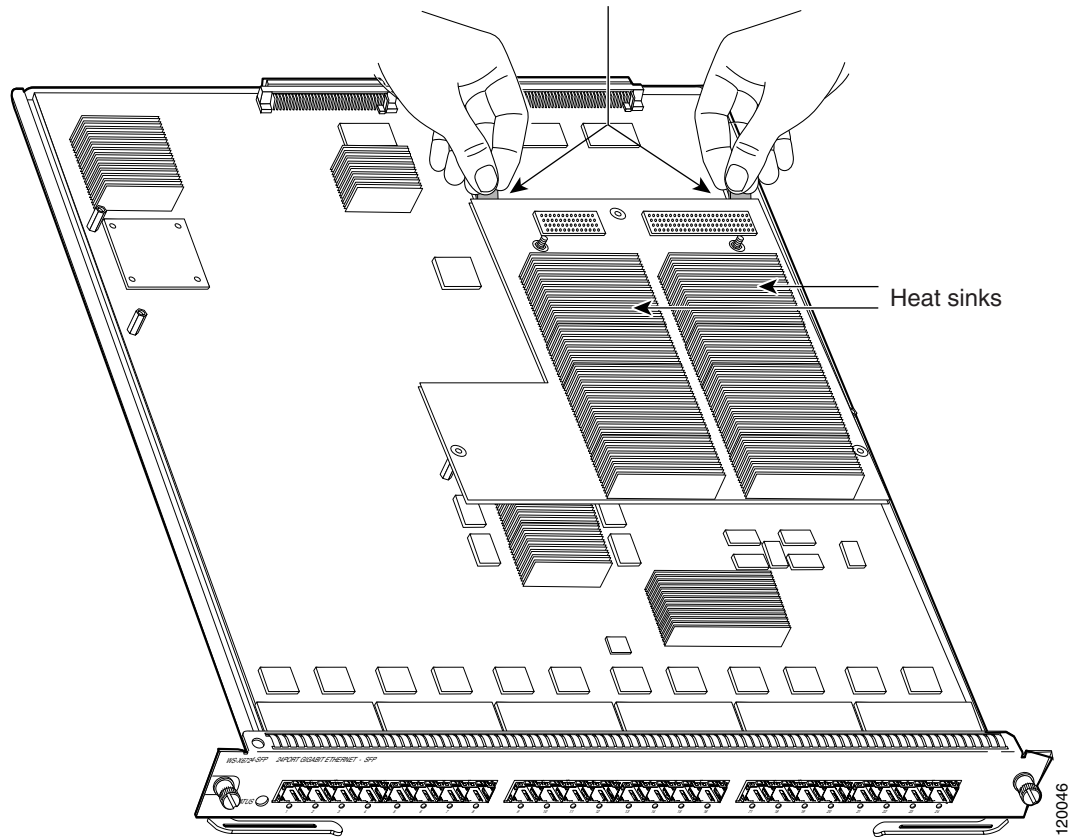
- Step 5** To unseat the CFC daughter card from the Ethernet module, hold each tab at the rear of the CFC daughter card between your thumb and index finger, and gently press down on both tabs until the connectors are unseated. (See [Figure 2.](#))



**Caution**

Do not apply too much pressure on the tabs. Applying too much pressure on the tabs can cause damage to the module.

**Figure 2** *Unseating the CFC Daughter Card Connectors*



- Step 6** Gently lift the CFC daughter card with both hands and remove the CFC daughter card from the module.
- Step 7** Place the CFC daughter card on an antistatic mat, antistatic foam pad, or in an antistatic bag.
- Step 8** Proceed to the [“Installing the DFC3 Daughter Card”](#) section on page 23.

## Removing the DFC3 Daughter Card

This section contains two DFC3 daughter card removal procedures. One procedure covers how to remove the DFC3 daughter card from modules that are not equipped with a stiffener bracket. A second procedure is included that covers how to remove the DFC daughter card from early versions of the WS-X6748-GE-TX Ethernet module that are equipped with a stiffener bracket.



**Note**

Only the WS-X6748-GE-TX Ethernet module might be equipped with a stiffener bracket.

## Removing the DFC3 Daughter Card from Modules Without Stiffener Brackets

To remove the DFC3 daughter card from modules that are not equipped with a stiffener bracket, follow these steps:

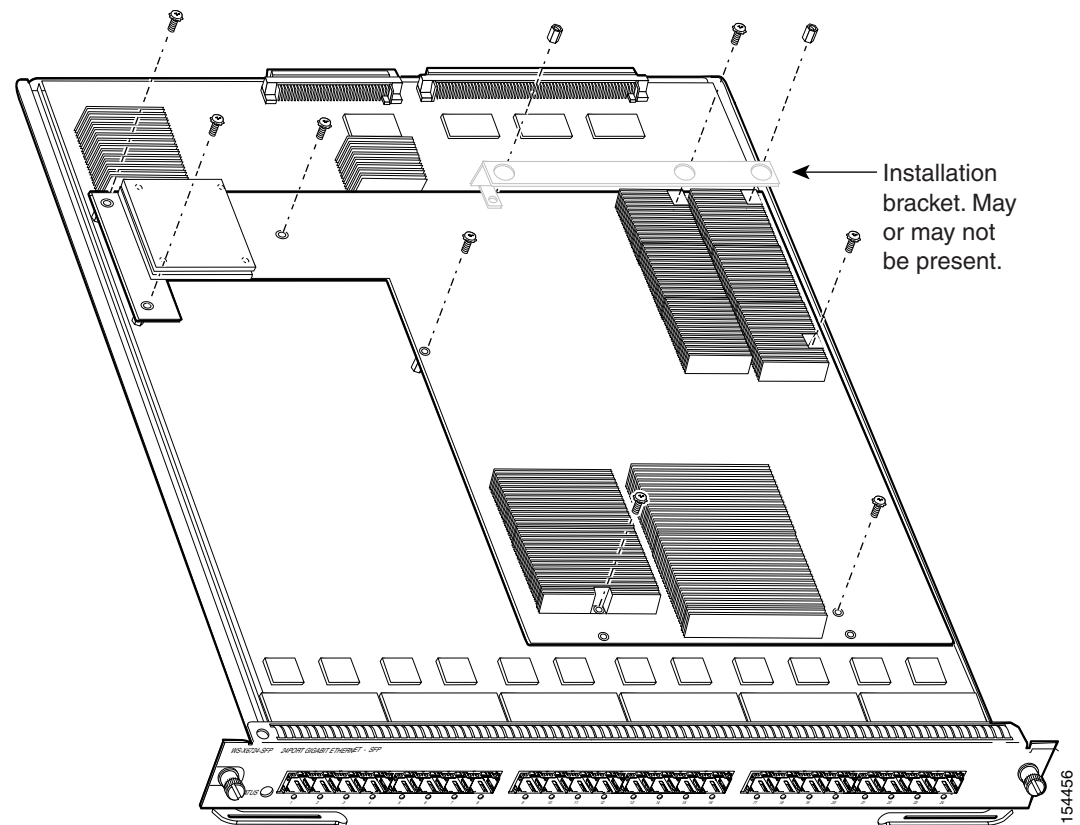


### Warning

**During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 94

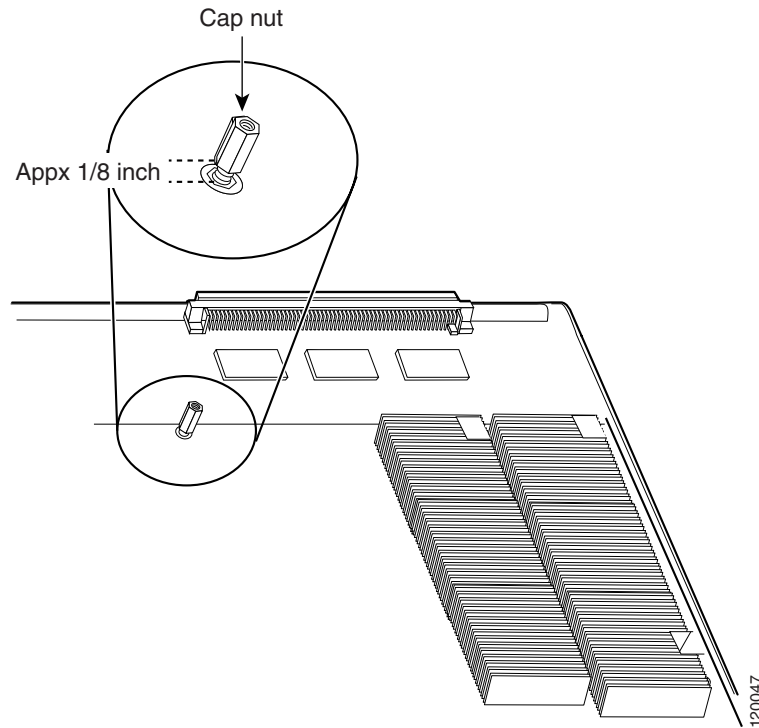
- Step 1** Attach an ESD grounding strap to your wrist and to ground. (If you are unsure about the correct way to attach an ESD grounding strap, refer to the [“Attaching Your ESD Grounding Strap”](#) section on page 40 for instructions.)
- Step 2** Remove the Ethernet module from the Catalyst 6500 series switch. (If you are unsure about the correct procedure for removing a module from the switch chassis, refer to the [“Removing and Installing Modules in the Chassis”](#) section on page 32 for removal instructions.)
- Step 3** Place the Ethernet module on an antistatic mat with the front of the module facing toward you.
- Step 4** If your DFC daughter card has a small metal installation bracket as shown in [Figure 3](#), use a No.1 Phillips-head screwdriver to remove the two cap nuts and the one screw securing the bracket. Set them aside with the bracket. If there is no bracket, just remove the two cap nuts and the one screw.
- Step 5** Remove the remaining securing screws. (See [Figure 3](#).)

**Figure 3** Removing the DFC Daughter Card Securing Screws and Cap Nuts



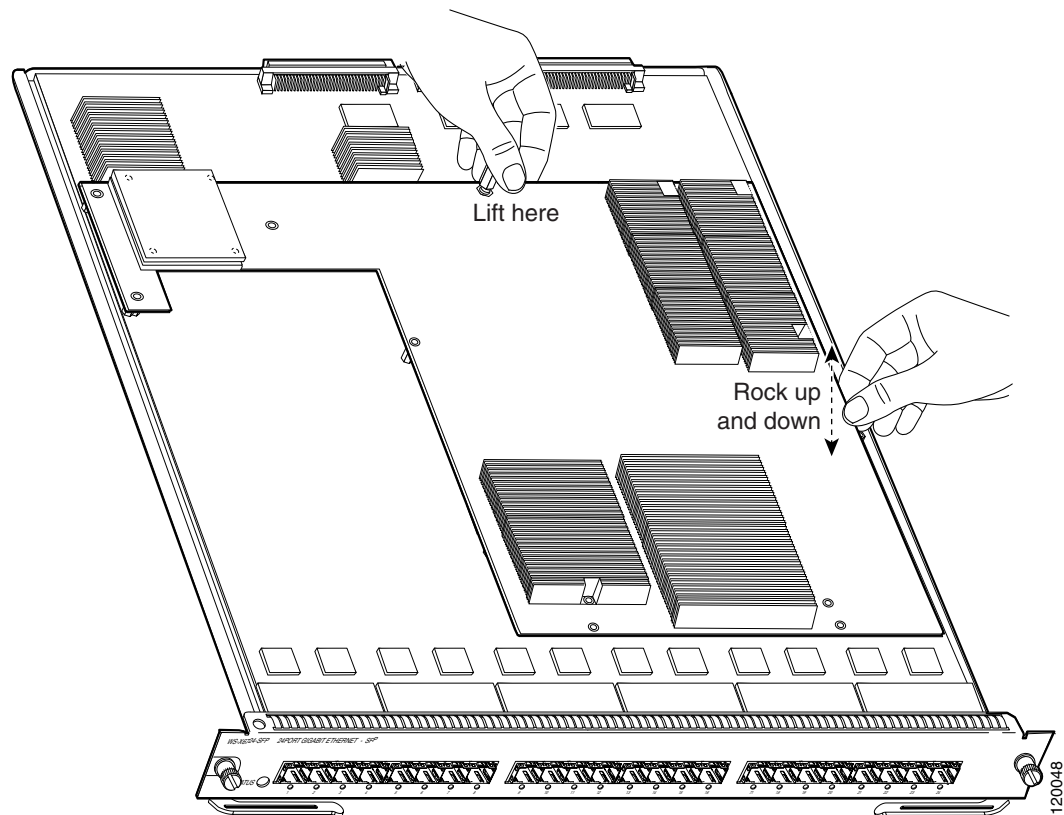
- Step 6** Partially reinstall the cap nut, as shown in [Figure 4](#), about 3 turns so that there is a space of about 1/8 inch (3 mm) between the bottom of the cap nut and the top of the DFC3 daughter card. The cap nut acts as a stop when you unseat the daughter card connector so that the DFC3 daughter card does not move horizontally and cause damage to the base board.

**Figure 4** *Partially Installing the Cap Nut*



- Step 7** With your left hand, lift slightly at the location shown in [Figure 5](#). While lifting with your left hand, rock the DFC3 daughter card up and down with your right hand, no more than half an inch in either direction, to unseat the DFC3 daughter card from the module.

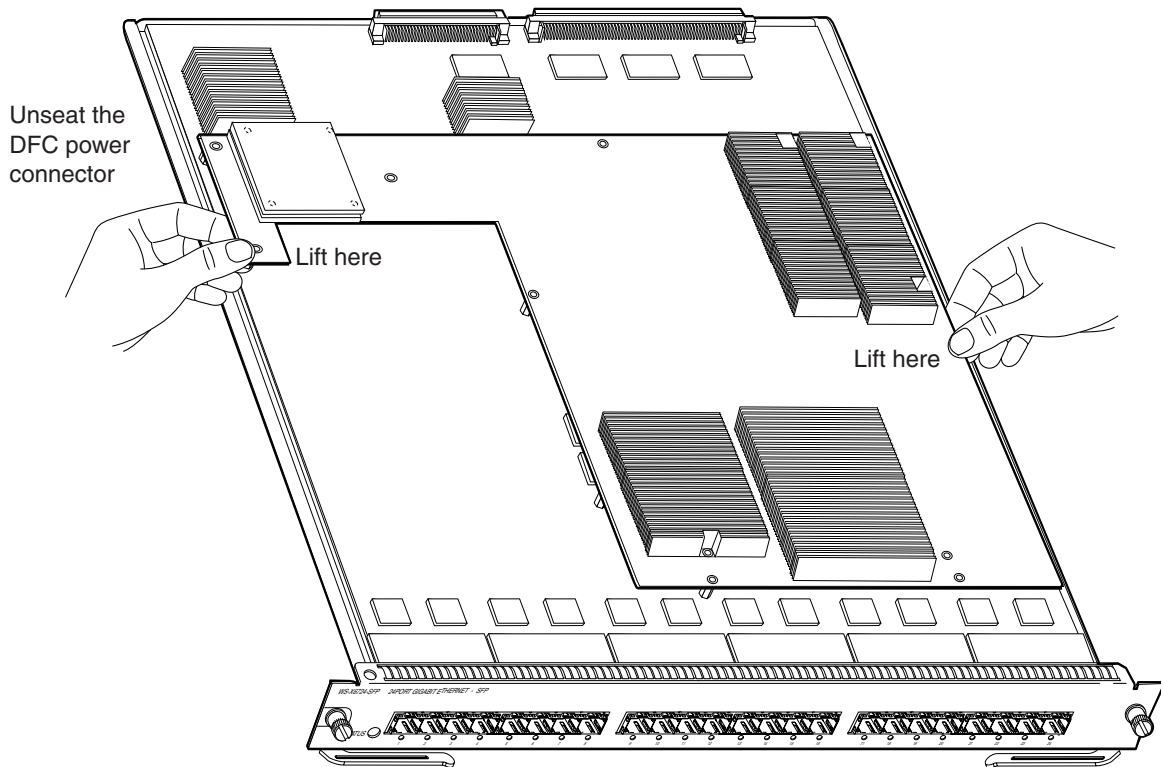
**Figure 5** Unseat the DFC3 Daughter Card from the Module



**Step 8** Remove the one cap nut.

**Step 9** Holding the DFC3 daughter card with both hands, gently lift it straight up from the module. (See [Figure 6](#).) Immediately place the DFC3 daughter card on an antistatic mat, antistatic foam pad, or in an antistatic bag.

**Figure 6** *Removing the DFC3 Daughter Card from the Module*



## Removing the DFC3 Daughter Card from Modules Equipped with a Stiffener Bracket



### Warning

During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself. Statement 94



### Note

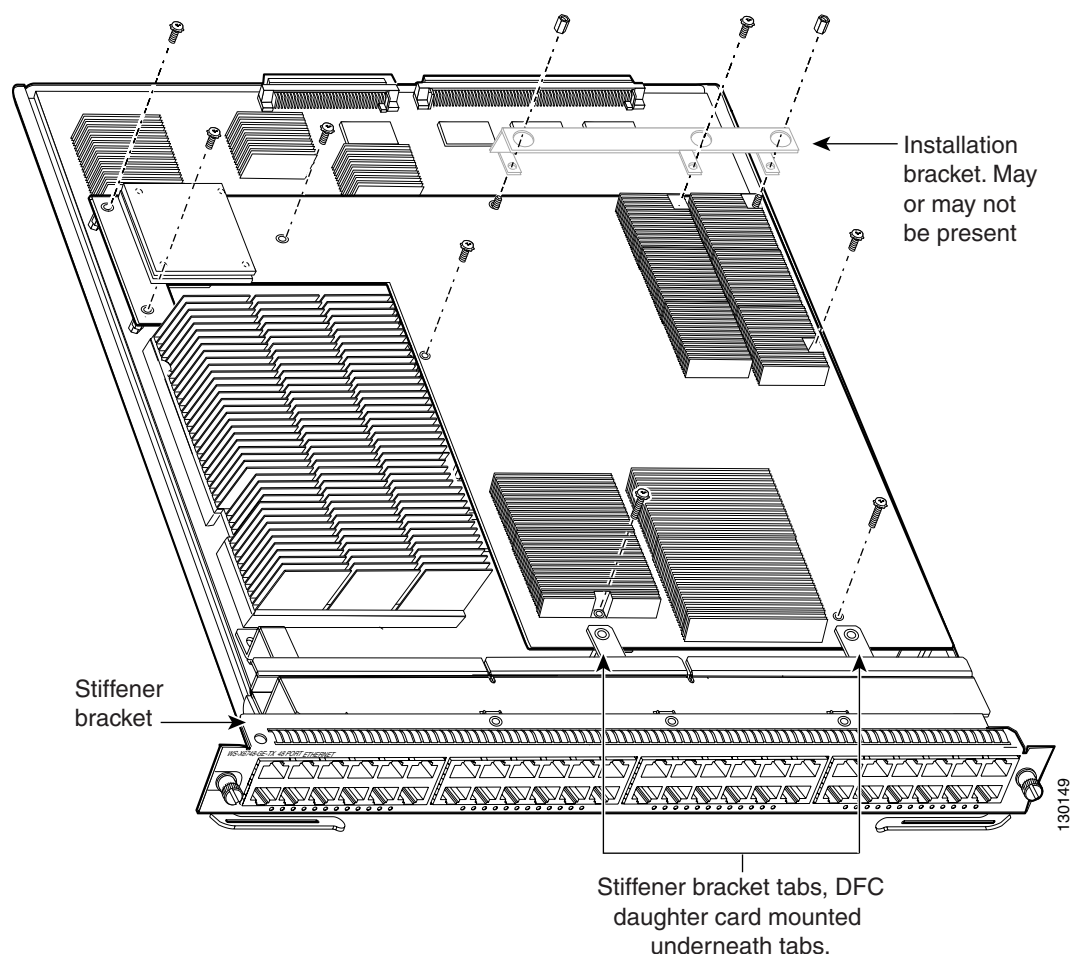
Some early versions of the WS-X6748-GE-TX Ethernet modules have a stiffener bracket mounted across the top front part of the module. A modified procedure to remove the DFC daughter card from WS-X6748-GE-TX Ethernet modules equipped with a stiffener bracket is included.



To remove a DFC3 daughter card from a WS-X6748-GE-TX Ethernet module equipped with a stiffener bracket, follow these steps:

- Step 1** Attach an ESD grounding strap to your wrist and to ground. (If you are unsure about the correct way to attach an ESD grounding strap, refer to the [“Attaching Your ESD Grounding Strap”](#) section on page 40 for instructions.)
- Step 2** Remove the WS-X6748-GE-TX Ethernet module from the Catalyst 6500 series switch. (If you are unsure about the correct procedure for removing a module from the switch chassis, refer to the [“Removing and Installing Modules in the Chassis”](#) section on page 32 for removal instructions.)
- Step 3** Place the module on an antistatic mat or foam with the front of the module facing toward you.
- Step 4** If your DFC daughter card has a small metal installation bracket as shown in [Figure 7](#), use a No.1 Phillips-head screwdriver to remove the two cap nuts and the one screw securing the bracket. Set them aside with the bracket. If there is no installation bracket, remove the two cap nuts and the one screw.
- Step 5** Use a Phillips-head screwdriver to remove the remaining securing screws. (See [Figure 7](#).)

**Figure 7** *Removing the Securing Screws and Cap Nuts (WS-X6748-GE-TX Equipped with a Front Stiffener Bracket)*



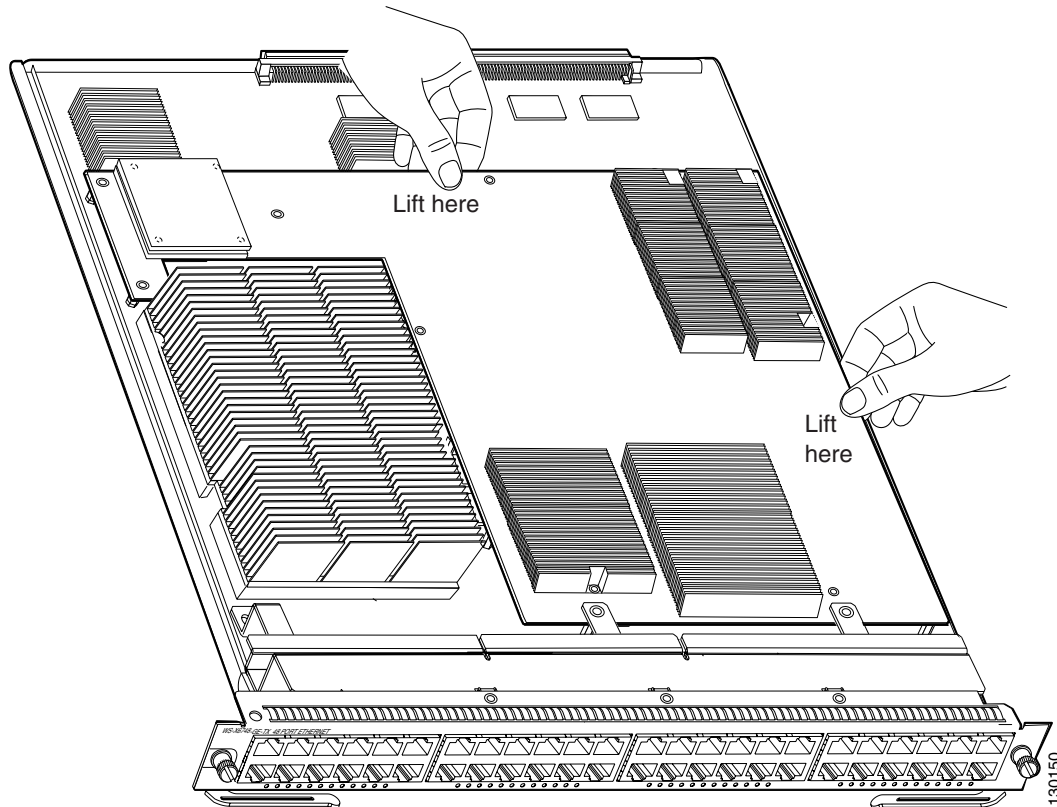


**Note**

The two screws securing the DFC3 daughter card that pass through the front stiffener bracket tabs are longer than the remaining DFC installation screws.

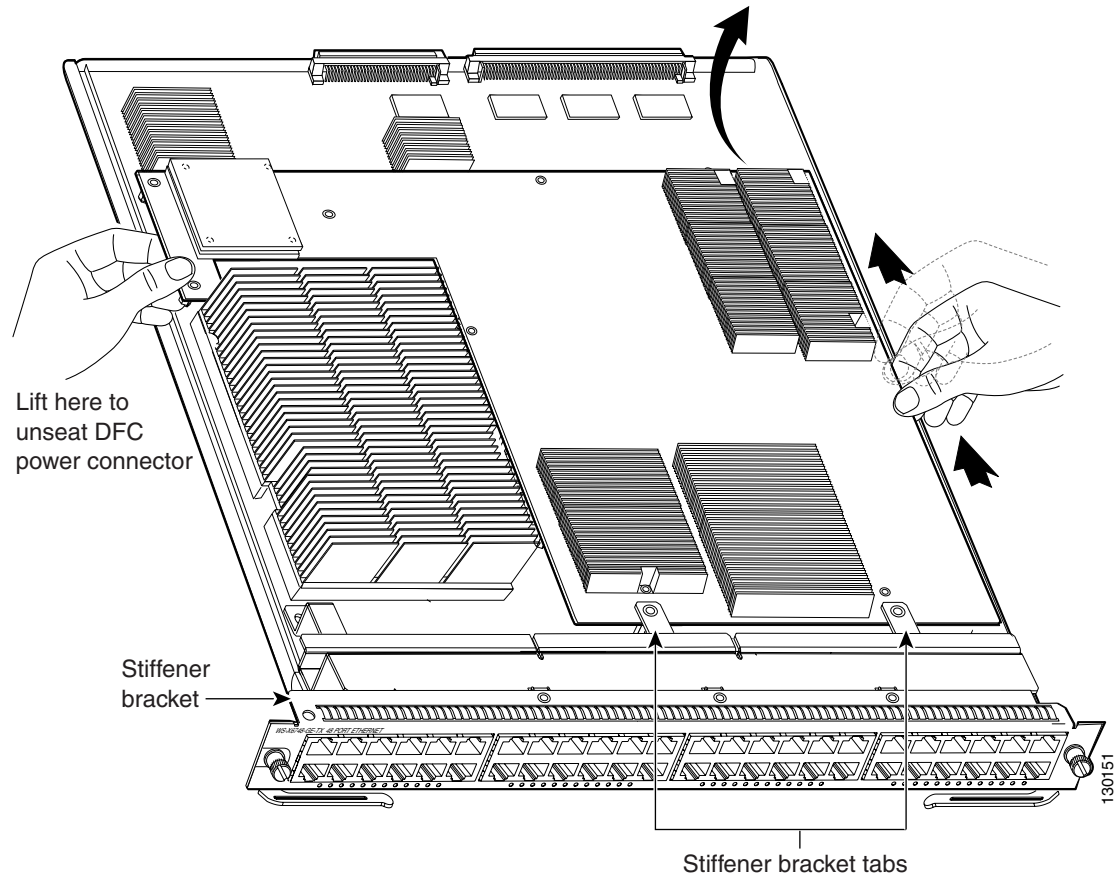
- Step 6** With your left hand, lift slightly at the location shown in [Figure 8](#), and gently rock the DFC3 daughter card up and down to unseat the daughter card from the module connectors.

**Figure 8** *Unseating the DFC Connectors (WS-X6748-GE-TX Equipped with a Front Stiffener Bracket)*



- Step 7** Holding the DFC3 daughter card with both hands, carefully lift the back end of the DFC3 daughter card up slightly to clear the module connectors, and then carefully slide the DFC3 daughter card out from under the two front stiffener bracket tabs. Lift the DFC3 daughter card straight up from the module (see [Figure 9](#)) and immediately place the removed DFC3 daughter card on an antistatic mat, antistatic foam pad, or in an antistatic bag.

**Figure 9** *Removing the DFC3 Daughter Card (WS-X6748-GE-TX Equipped with a Front Stiffener Bracket)*



## Upgrading the DFC3BXL Daughter Card Memory

Upgrading your module with a DFC3BXL daughter card requires that you also install a 1-GB memory upgrade (part number MEM-XCEF720-1GB) that comes with your DFC3BXL upgrade kit. This memory upgrade is installed on the module in a small outline dual inline memory module (SODIMM) chip socket located underneath the DFC daughter card. You should install the memory upgrade while the CFC or the DFC daughter card is removed from the module and before you install the DFC3BXL daughter card upgrade.

## Removing the SODIMM



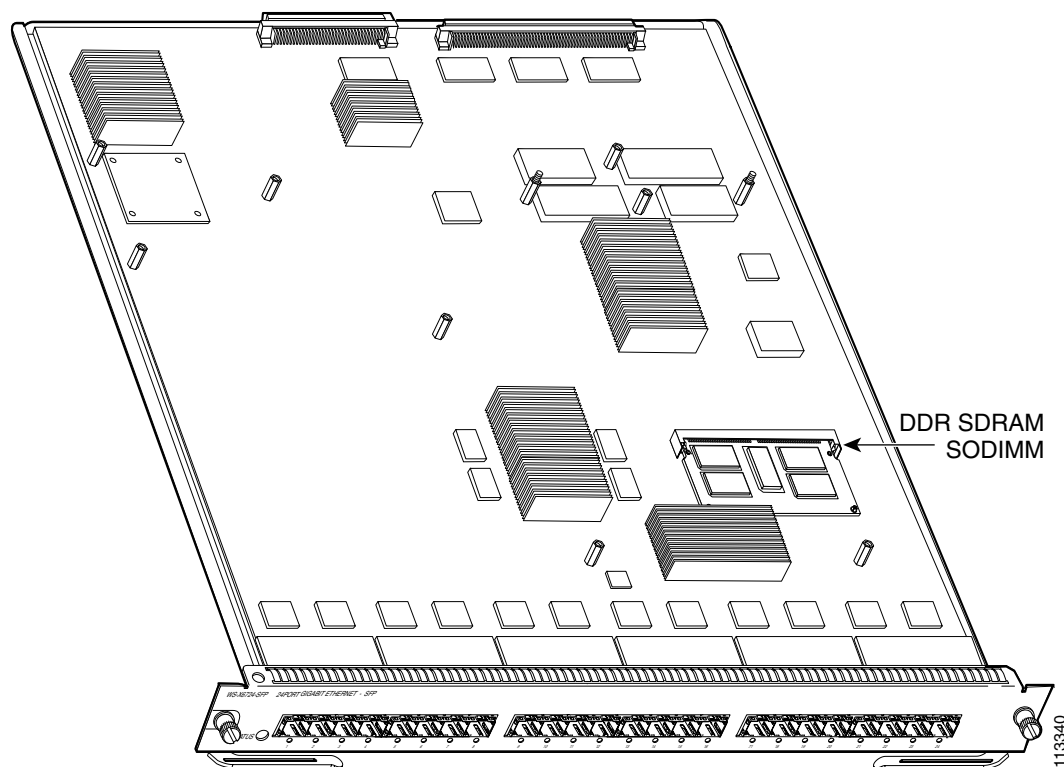
### Warning

During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself. Statement 94

To remove the existing SODIMM, follow these steps:

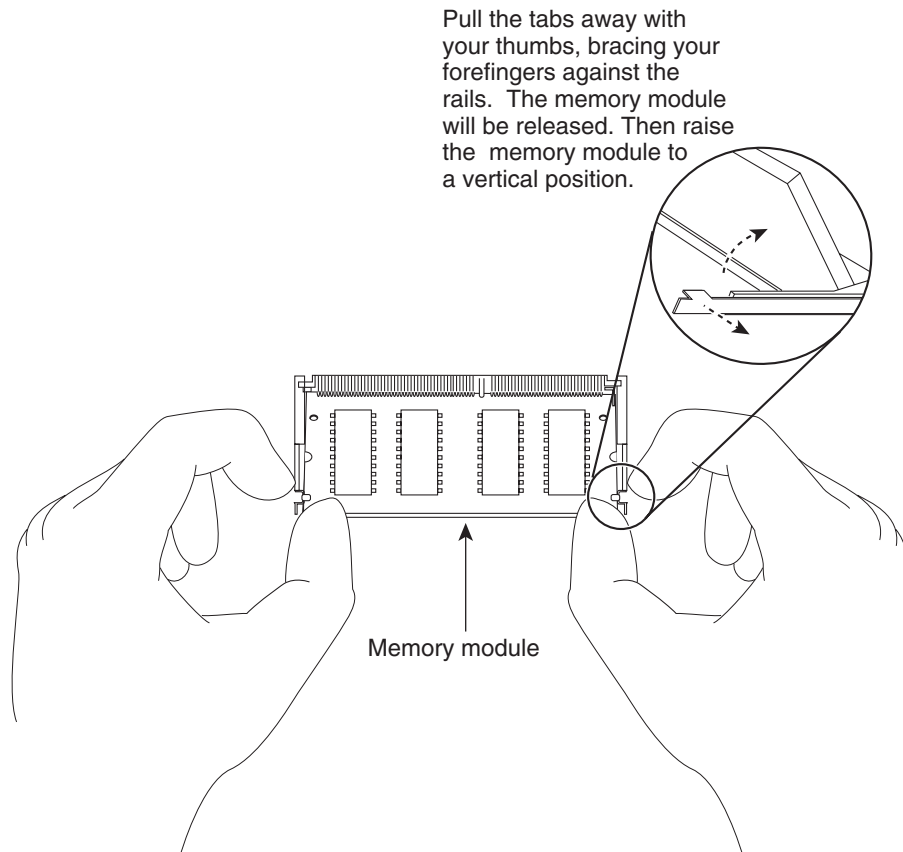
- Step 1** Attach an ESD grounding strap to your wrist and to ground. (If you are unsure about the correct way to attach an ESD grounding strap, refer to the [“Attaching Your ESD Grounding Strap”](#) section on page 40 for instructions.)
- Step 2** Locate the SODIMM on the module. (See [Figure 10](#).)

**Figure 10** Location of SODIMM on a WS-X67xx Module



**Step 3** Release the spring clips from the SODIMM, and release the SODIMM from the socket. (See [Figure 11](#).)

**Figure 11** Releasing the SODIMM Spring Clips



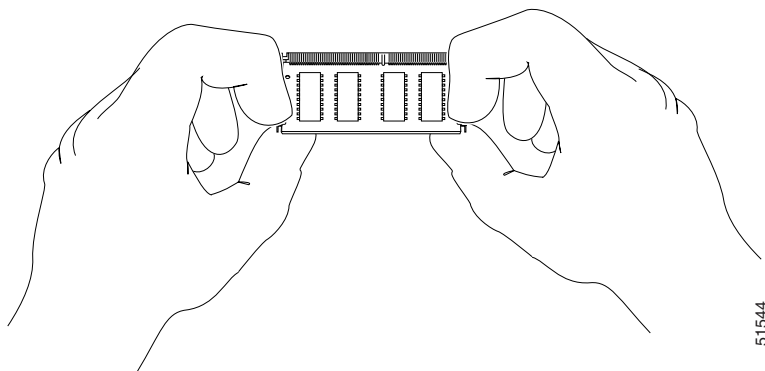
**Step 4** When both ends of the SODIMM are released from the socket, grasp the ends of the SODIMM with your thumb and forefinger, and pull the SODIMM completely out of the socket.



**Caution**

SODIMMs are sensitive components that are susceptible to ESD damage. To prevent ESD damage, handle SODIMMs by the edges only; avoid touching the memory modules, pins, or traces (the metal *fingers* along the connector edge of the SODIMM). (See [Figure 12](#).)

**Figure 12 Handling a SODIMM**



- Step 5** Immediately place the old SODIMM in an antistatic bag to protect it from ESD damage.

## Installing the SODIMM



**Caution**

SODIMMs are sensitive components that are susceptible to ESD damage. To prevent ESD damage, handle SODIMMs by the edges only; avoid touching the memory modules, pins, or traces (the metal *fingers* along the connector edge of the SODIMM). (See [Figure 12](#).)

To install the 1-GB SODIMM, follow these steps:

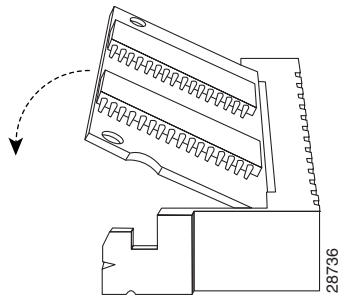
- Step 1** Remove a new SODIMM from the antistatic shipping bag.
- Step 2** Hold the SODIMM with the component side up and with the connector edge (the metal fingers) away from you.
- Step 3** Hold the sides of the SODIMM between your thumbs and forefingers. (See [Figure 12](#).)
- Step 4** Tilt the SODIMM to approximately the same angle as the socket, and insert the connector edge into the socket.



**Caution**

When inserting SODIMMs, use firm but not excessive pressure. If you damage a socket, you will have to return the DFC to the factory for repair.

- Step 5** Press the SODIMM down until it is secured by the spring clips. (See [Figure 13](#).)

**Figure 13** Installing the SODIMM

- Step 6** When the SODIMM is installed, check the two alignment holes, and ensure that the spring retainer is visible. If it is not, the SODIMM is not seated properly. If any SODIMM appears misaligned, carefully remove it and reseal it in the socket. Push the SODIMM firmly back into the socket until the retainer springs snap into place.

## Installing the DFC3 Daughter Card

This section contains two DFC3 installation procedures. One procedure covers installing the DFC3 daughter card on modules that are not equipped with stiffener brackets. A second procedure is included that covers installing the DFC daughter cards on WS-X6748-GE-TX modules that are equipped with stiffener brackets.

### Installing the DFC3 Daughter Card on Modules Without Stiffener Brackets

To install the DFC3 on modules that do not have stiffener brackets, follow these steps:



#### Warning

**During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 94

- Step 1** Attach an ESD grounding strap to your wrist and to ground. (If you are unsure about the correct way to attach an ESD grounding strap, refer to the [“Attaching Your ESD Grounding Strap”](#) section on page 40 for instructions.)
- Step 2** Remove the new DFC3 from the antistatic bag and the installation hardware from the bag.

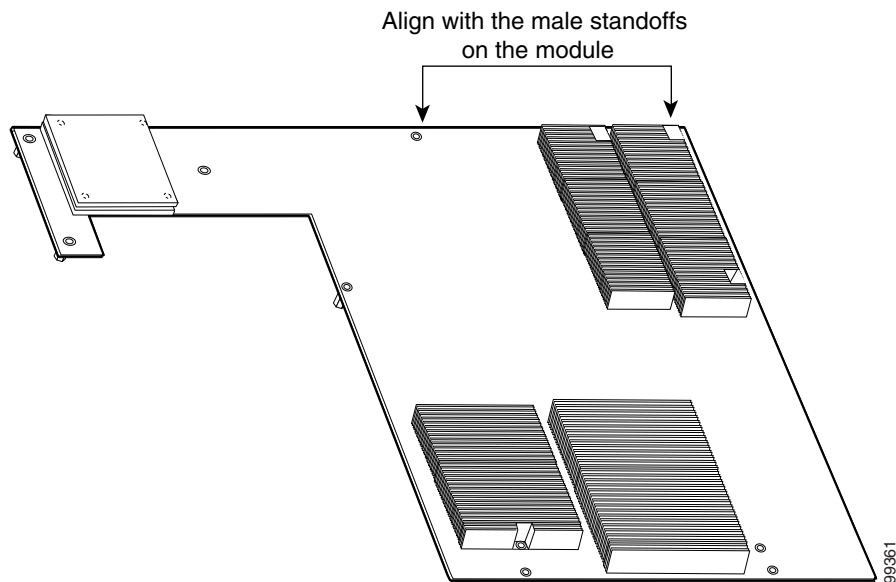


#### Note

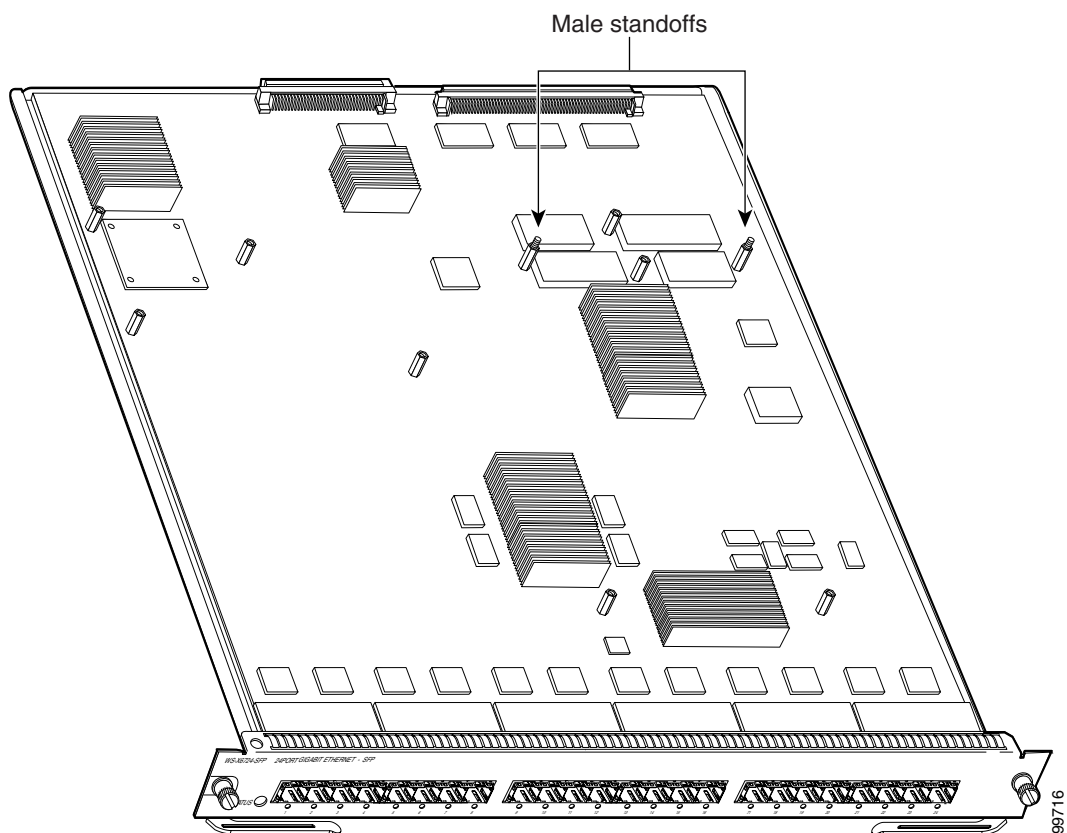
The DFC3 daughter card is designed to be installed on different modules; therefore, there may be more mounting holes on the DFC3 daughter card than there are standoffs on the module. Not all mounting holes on the DFC3 daughter card will be used in all installations. Visually verify that there are standoffs beneath the mounting holes before installing the securing screws.

- Step 3** Align the mounting holes on the DFC3 daughter card (see [Figure 14](#)) with the male standoffs on the module. (See [Figure 15](#).) Make sure that the remaining mounting holes on the DFC3 daughter card are aligned with the remaining standoffs on the module.

**Figure 14** *Mounting Holes on the DFC3 Daughter Card*



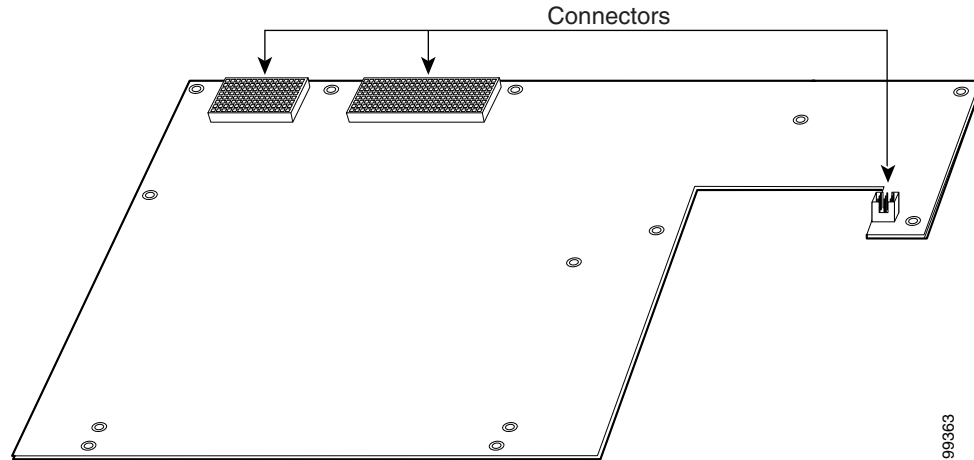
**Figure 15** *Male Standoff Locations on the WS-X67xx Modules*





- Step 4** Ensure that the connectors on the DFC3 are aligned with the connectors on the module. [Figure 16](#) shows the connectors on the underside of the DFC3.

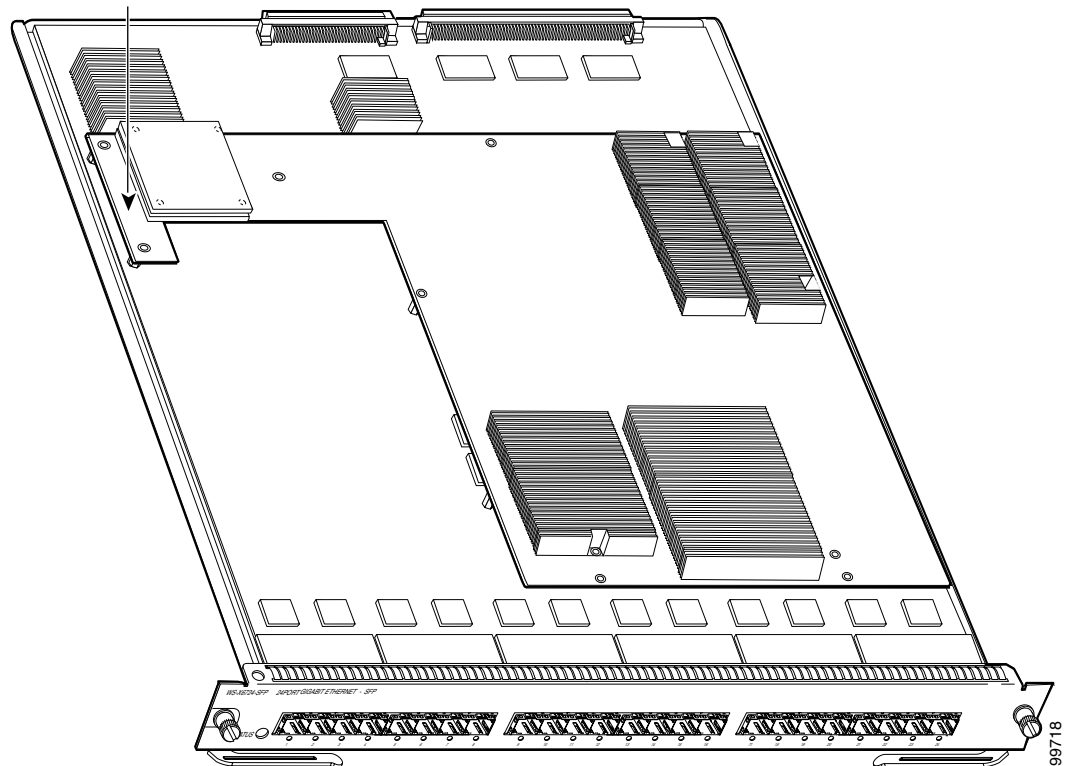
**Figure 16** *DFC3 Daughter Card Connectors (Underside of DFC Daughter Card Shown)*



- Step 5** Apply pressure to the area shown in [Figure 17](#) to seat the power connector.

**Figure 17** *Seating the Power Connector*

Apply pressure here to seat power connector



**Caution**

Use care not to damage the connectors on the module. If you damage a connector, it will be necessary to return the module to Cisco for repair.

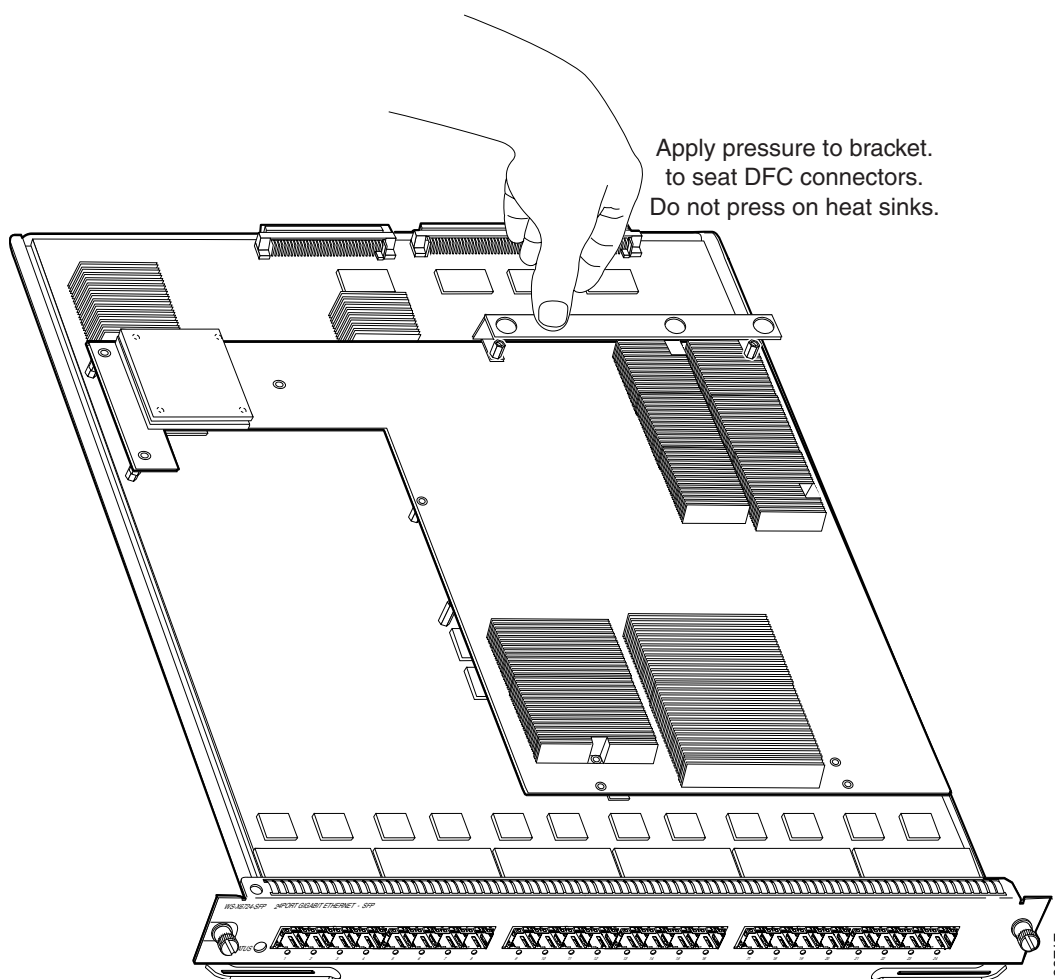
**Step 6**

Position the installation bracket over the two male standoffs at the back of the DFC daughter card. Apply pressure to the top of the bracket, as shown in [Figure 18](#) to fully seat the DFC3 daughter card on the module.

**Caution**

When seating the DFC daughter card, do not apply pressure to any other location on the DFC daughter card, especially the heat sinks.

**Figure 18**      *Seating the DFC3 Daughter Card on the Module*

**Step 7**

Use a Phillips-head screwdriver to install the securing screws and the two cap nuts. (See [Figure 19](#).)

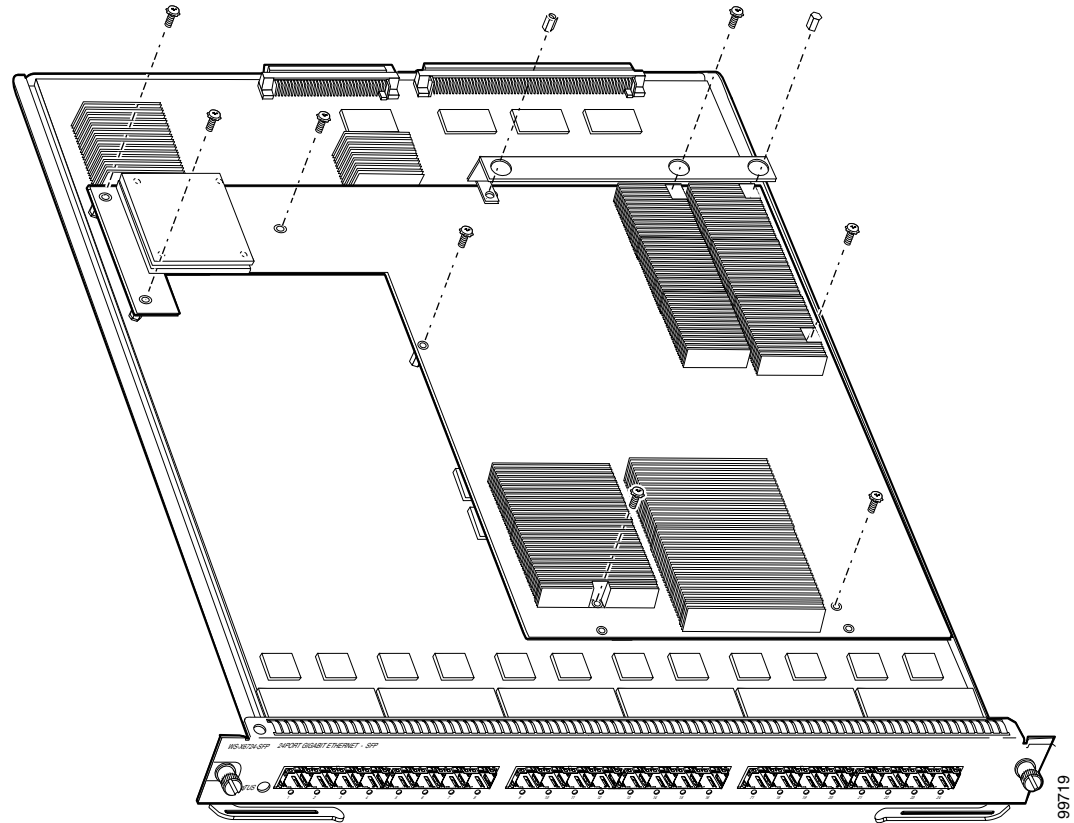
**Caution**

You *must* install screws in all available standoffs. The screws provide grounding between the DFC3 daughter card and the module. Failure to install all of the screws will invalidate the safety approvals and pose a risk of fire and electrical hazard.

**Note**

You should visually verify that there are standoffs beneath the mounting holes before installing the securing screws.

**Figure 19** *Installing the Securing Screws and Cap Nuts*



- Step 8** Reinstall the Ethernet module in the chassis. (If you are unsure on the correct procedure for installing a module in the switch chassis, refer to the [“Removing and Installing Modules in the Chassis”](#) section on [page 32](#) for installation instructions.)

## Installing the DFC3 Daughter Card on Modules Equipped with a Stiffener Bracket



### Note

Some early versions of the WS-X6748-GE-TX Ethernet modules have a stiffener bracket mounted across the top front part of the module, which requires a modified procedure to install the DFC daughter card.



### Warning

**During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 94

To install the DFC daughter card on a WS-X6748-GE-TX Ethernet module that is equipped with a stiffener bracket, follow these steps:

**Step 1** Attach an ESD grounding strap to your wrist and to ground. (If you are unsure about the correct way to attach an ESD grounding strap, refer to [“Attaching Your ESD Grounding Strap”](#) section on page 40 for instructions.)

**Step 2** Remove the new DFC3 daughter card from the antistatic bag and the installation hardware from the bag.



### Note

The DFC3 daughter card is designed to be installed on different modules; therefore, there may be more mounting holes on the DFC3 daughter card than there are standoffs on the module. Not all mounting holes on the DFC3 daughter card will be used in all installations. Visually verify that there are standoffs beneath the mounting holes before installing the securing screws.

**Step 3** Position the DFC3 daughter card over the module, and slightly tilt the DFC3 daughter card so that the back end will clear the module connectors.

**Step 4** Carefully slide the DFC3 under the two stiffener bracket tabs. (See [Figure 20](#).) Verify that the DFC daughter card is under the two stiffener bracket tabs.



### Caution

You must position the DFC daughter card *under* the two stiffener bracket tabs. If you install the DFC daughter card above the two stiffener bracket tabs, you can permanently damage the DFC daughter card.

**Step 5** Align the mounting holes on the DFC3 daughter card with the male standoffs on the module. (See [Figure 20](#).) Make sure that the remaining mounting holes on the DFC3 daughter card are aligned with the remaining standoffs.

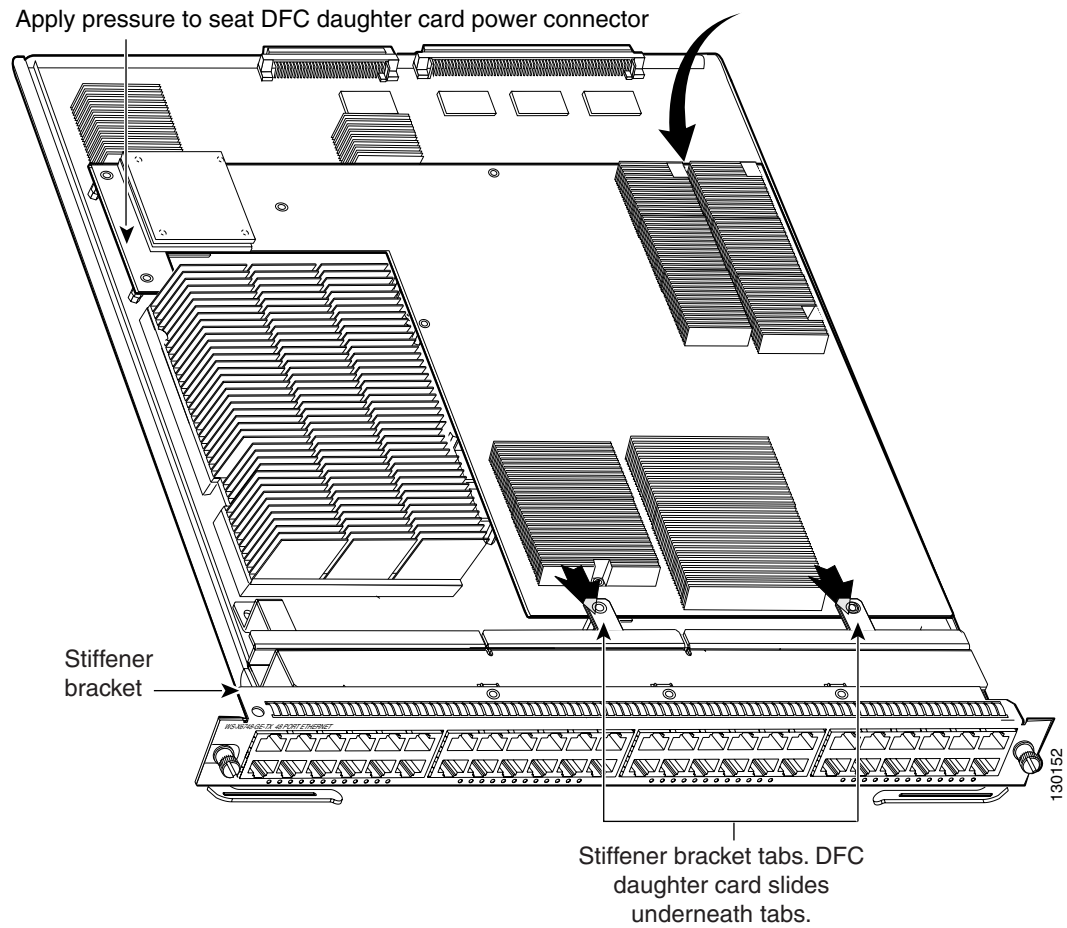


### Note

You should visually verify that there are standoffs beneath the mounting holes before installing the securing screws.

**Step 6** Press down on the edge of the DFC3 daughter card (see [Figure 20](#)) to seat the DFC3 daughter card power connector to the module power connector.

**Figure 20** Seating the DFC Daughter Card Power Connector (WS-X6748-GE-TX Equipped with a Front Stiffener Bracket)

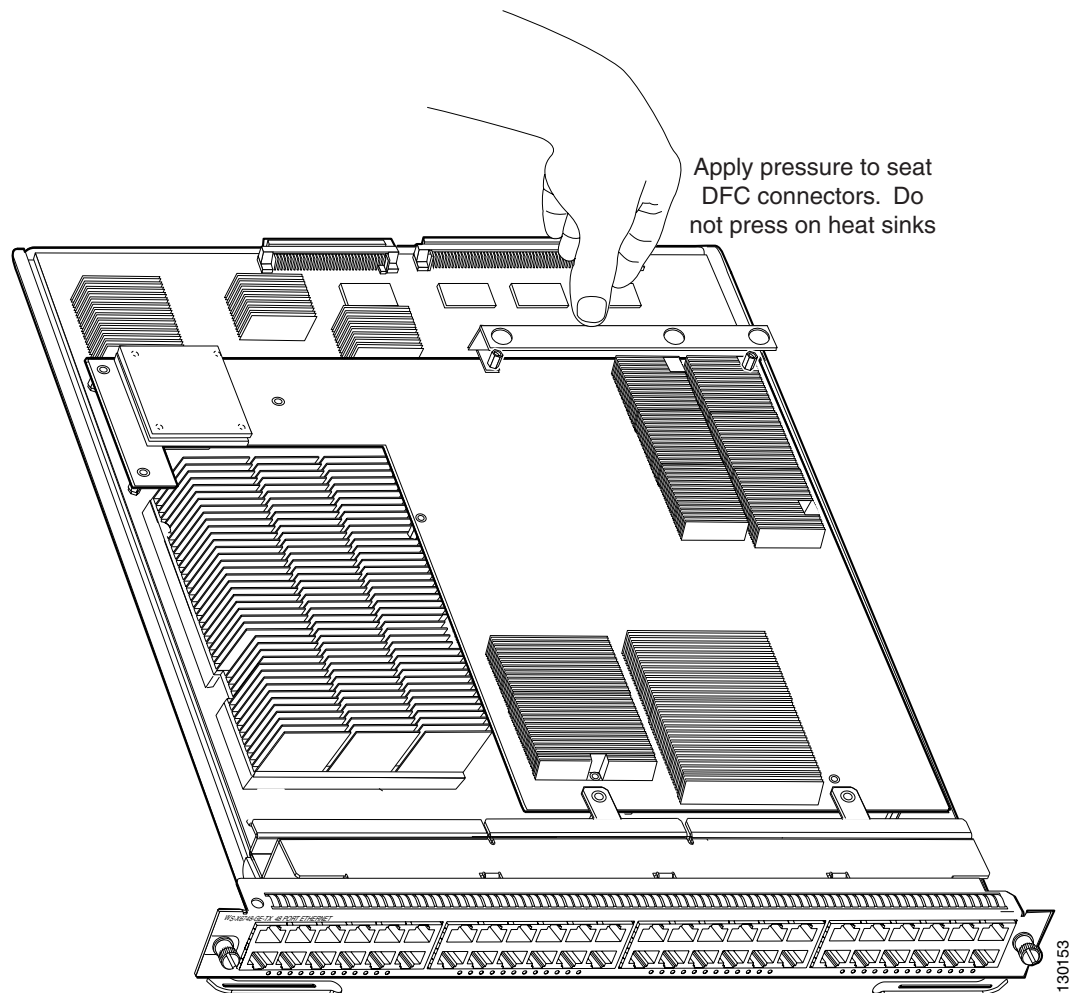


- Step 7** Position the installation bracket over the two standoffs and press down on the top of the bracket to seat the DFC3 daughter card connectors on the module connectors. (See [Figure 21](#).)

**Caution**

When seating the DFC3 daughter card on the module connectors, *DO NOT* touch or apply any pressure to the heat sinks. Press down on the installation bracket only.

**Figure 21** *Seating the DFC3 on the Module (WS-X6748-GE-TX Equipped with a Front Stiffener Bracket)*

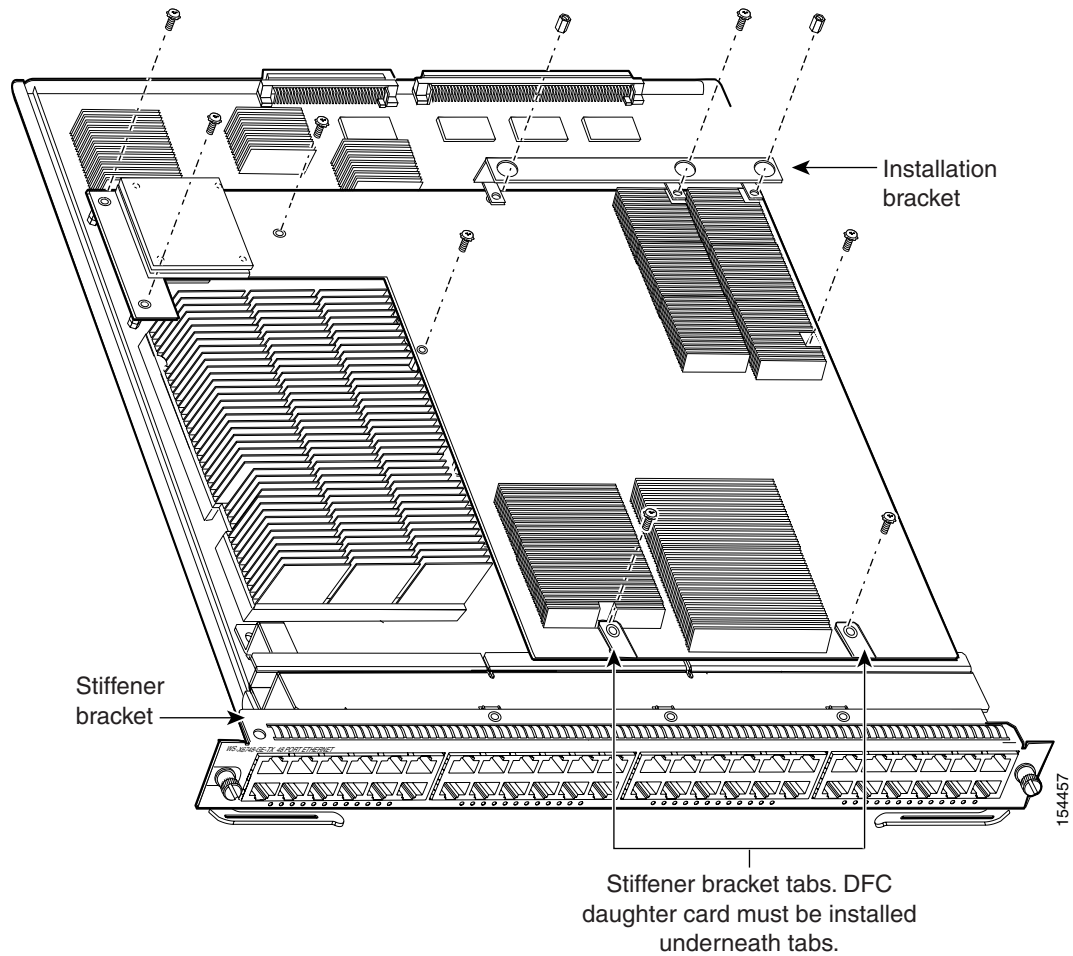


- Step 8** Secure the DFC3 daughter card to the module through the stiffener bracket with the two long screws that you previously removed.
- Step 9** Continue installing the remainder of the screws and the cap nuts to fully attach the DFC3 daughter card to the module. (See [Figure 22](#).)

**Caution**

Do not overtighten the screws and the cap nuts because you will damage the board.

**Figure 22** *Installing the Screws and Cap Nuts (WS-X6748-GE-TX Equipped with a Front Stiffener Bracket)*



**Caution**

You *must* install screws in all available standoffs. The screws provide grounding between the DFC3 daughter card and the module. Failure to install all screws will invalidate the safety approvals and pose a risk of fire and electrical hazard.

- Step 10** Reinstall the Ethernet module in the chassis. (If you are unsure about the correct procedure for installing a module in the switch chassis, refer to the [“Removing and Installing Modules in the Chassis”](#) section on page 32 for installation instructions.)

# Removing and Installing Modules in the Chassis

This section describes how to correctly remove and install a module in a Catalyst 6500 series switch chassis slot.



**Caution**

During this procedure, wear grounding wrist straps to avoid ESD damage to the card.



**Warning**

**Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.** Statement 272

## Removing a Module from the Chassis

To remove a module from the chassis, perform these steps:

- Step 1** Disconnect any network interface cables or console port cables attached to the module.
- Step 2** Attach an ESD grounding strap to your wrist and to ground. (If you are unsure about the correct way to attach an ESD grounding strap, refer to the [“Attaching Your ESD Grounding Strap”](#) section on page 40 for instructions.)
- Step 3** Verify that the captive installation screws on all of the modules in the chassis are tight. This step assures that the space created by the removed module is maintained.



**Note**

If the captive installation screws are loose, the electromagnetic interference (EMI) gaskets on the installed modules will push the modules toward the open slot, reducing the opening size and making it difficult to reinstall the module.

- Step 4** Loosen the two captive installation screws on the module.



- Step 5** Depending on the orientation of the slots in the chassis (horizontal or vertical), perform one of the following two sets of substeps:

**Horizontal slots**

- a. Place your thumbs on the left and right ejector levers, and simultaneously rotate the levers outward to unseat the module from the backplane connector.
- b. Grasp the front edge of the module and slide the module part of the way out of the slot. Place your other hand under the module to support the weight of the module. Do not touch the module circuitry.

**Vertical slots**

- a. Place your thumbs on the ejector levers located at the top and bottom of the module, and simultaneously rotate the levers outward to unseat the module from the backplane connector.
- b. Grasp the edges of the module, and slide the module straight out of the slot. Do not touch the module circuitry.

- Step 6** Place the module on an antistatic mat or antistatic foam.

## Installing a Module in the Chassis



**Caution**

To prevent ESD damage, handle modules by the carrier edges only and wear grounding wrist straps.



**Warning**

**Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.** Statement 1051

To install a module in the chassis, perform these steps:

- Step 1** Attach an ESD grounding strap to your wrist and to ground. (If you are unsure about the correct way to attach an ESD grounding strap, refer to the [“Attaching Your ESD Grounding Strap”](#) section on page 40 for instructions.)

- Step 2** Verify that the captive installation screws are tightened on all modules installed in the chassis. This assures that the EMI gaskets on all modules are fully compressed in order to maximize the opening space for the new module or the replacement module.



**Note**

If the captive installation screws are loose, the EMI gaskets on the installed modules will push adjacent modules toward the open slot, reducing the opening size and making it difficult to reinstall the module.

- Step 3** Fully open both ejector levers on the module. (See [Figure 23](#).)

- Step 4** Depending on the orientation of the slots in the chassis (horizontal or vertical), perform one of the following two sets of substeps:

**Horizontal slots**

- a. Position the module in the slot. (See [Figure 23](#).) Make sure that you align the sides of the module carrier with the slot guides on each side of the slot.
- b. Carefully slide the module into the slot until the EMI gasket along the top edge of the module makes contact with the module in the slot above it and both ejector levers have closed to approximately 45 degrees with respect to the module faceplate. (See [Figure 24](#).)
- c. Using the thumb and forefinger of each hand, grasp the two ejector levers and press down to create a small (0.040 inch [1 mm]) gap between the module's EMI gasket and the module above it. (See [Figure 24](#).)



**Caution**

Do not press down too hard on the levers. They will bend and be damaged.

- d. While gently pressing down, simultaneously close the left and right ejector levers to fully seat the module in the backplane connector. The ejector levers are fully closed when they are flush with the module faceplate. (See [Figure 25](#).)



**Note**

Failure to fully seat the module in the backplane connector can result in error messages.

- e. Tighten the two captive installation screws on the module.

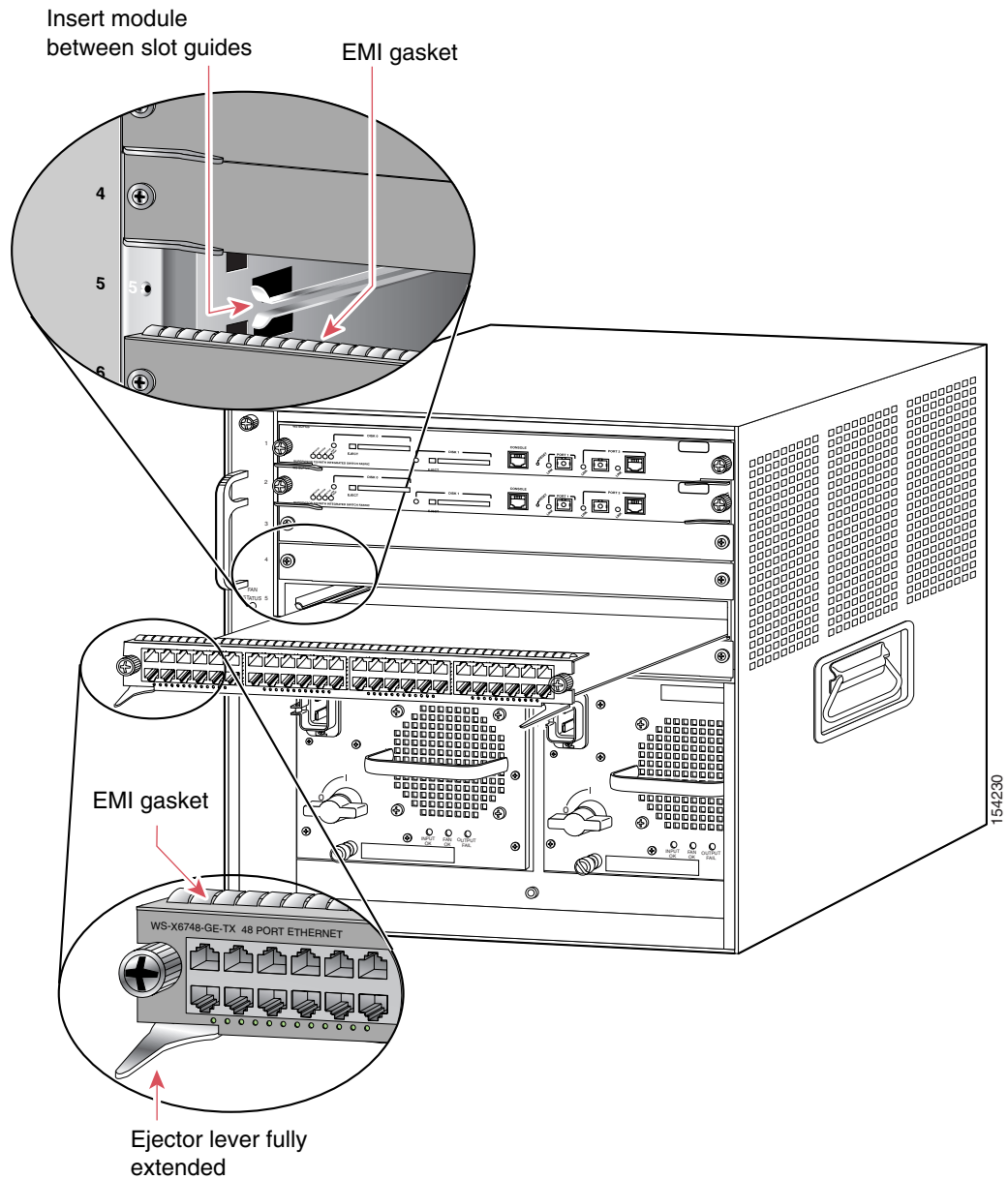


**Note**

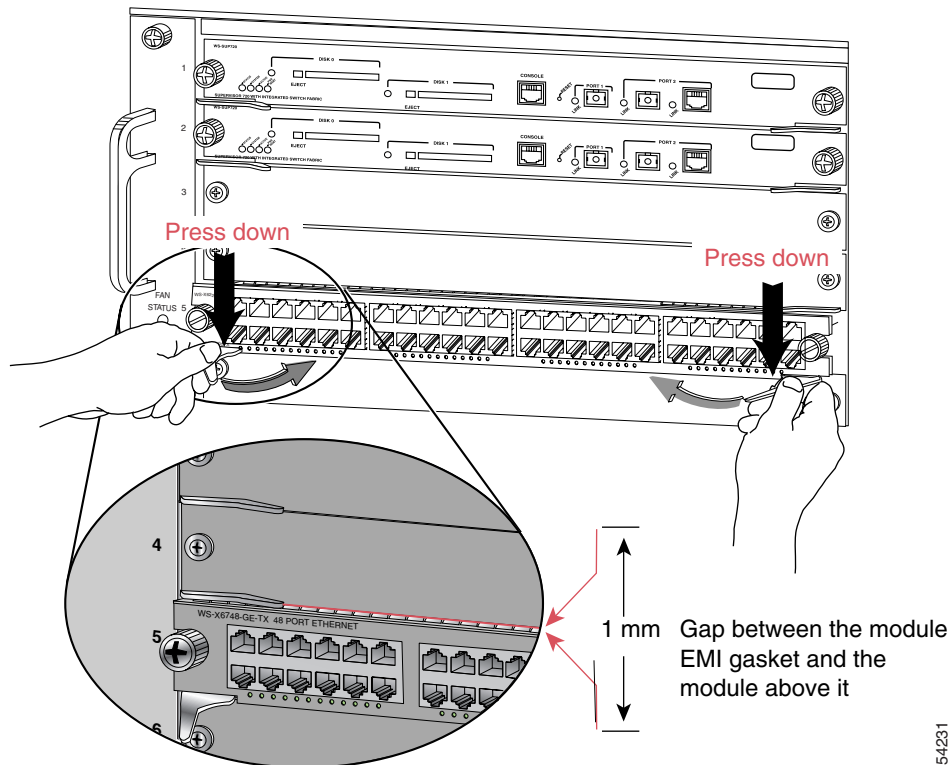
Make sure that the ejector levers are fully closed before tightening the captive installation screws.

- f. Verify that the module STATUS LED is lit. Check the STATUS LED periodically. If the STATUS LED changes from orange to green, the module has successfully completed the boot process and is now online. If the STATUS LED remains orange or turns red, the module has not successfully completed the boot process and may have encountered an error.

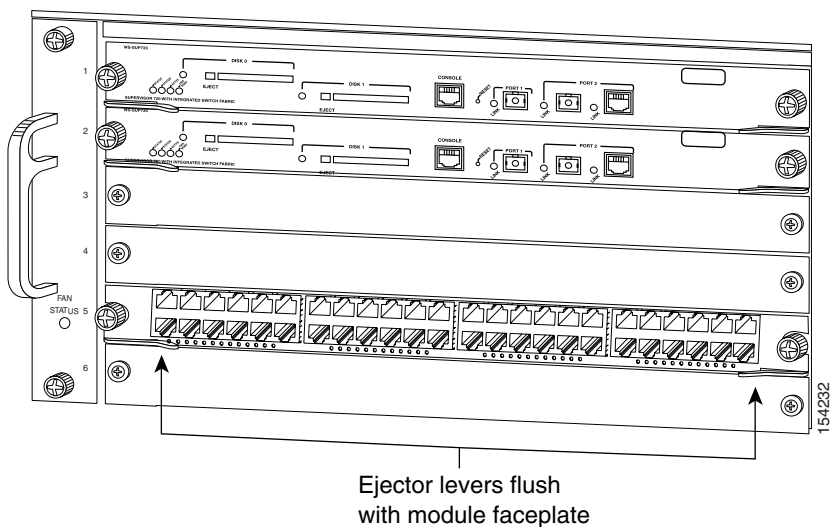
**Figure 23** Positioning the Module in a Horizontal Slot Chassis



**Figure 24** Clearing the EMI Gasket in a Horizontal Slot Chassis



**Figure 25** Ejector Lever Closure in a Horizontal Slot Chassis



**Vertical slots**

- a. Position the module in the slot. (See [Figure 26](#).) Make sure that you align the sides of the module carrier with the slot guides on the top and bottom of the slot.
- b. Carefully slide the module into the slot until the EMI gasket along the right edge of the module makes contact with the module in the slot adjacent to it and both ejector levers have closed to approximately 45 degrees with respect to the module faceplate. (See [Figure 27](#).)
- c. Using the thumb and forefinger of each hand, grasp the two ejector levers and exert a slight pressure to the left, deflecting the module approximately 0.040 inches (1 mm) to create a small gap between the module's EMI gasket and the module adjacent to it. (See [Figure 27](#).)

**Caution**


---

Do not exert too much pressure on the ejector levers. They will bend and be damaged.

---

- d. While gently pressing on the ejector levers, simultaneously close them to fully seat the module in the backplane connector. The ejector levers are fully closed when they are flush with the module faceplate. (See [Figure 28](#).)
- e. Tighten the two captive installation screws on the module.

**Note**

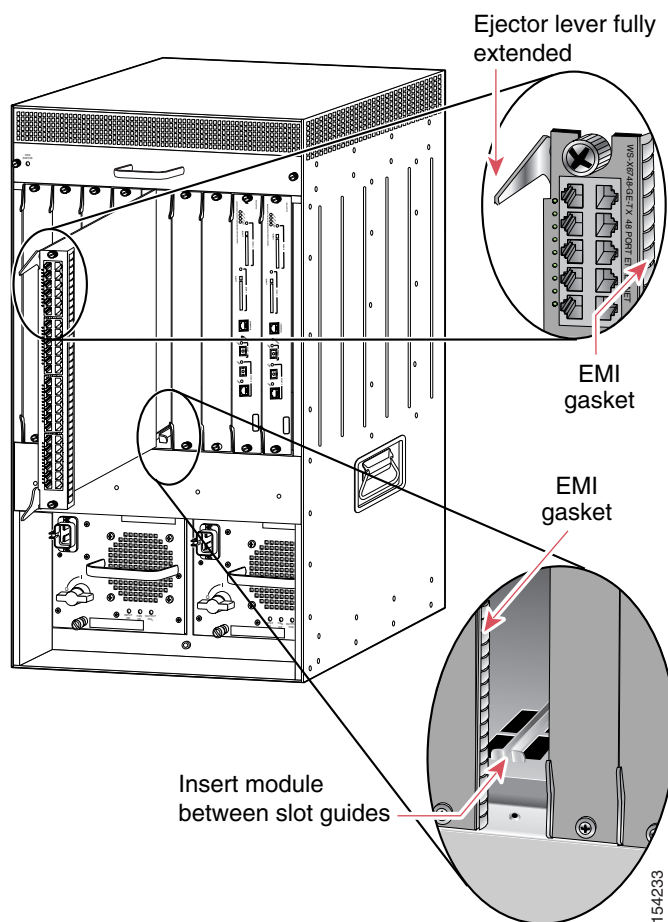

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Make sure that the ejector levers are fully closed before tightening the captive installation screws.

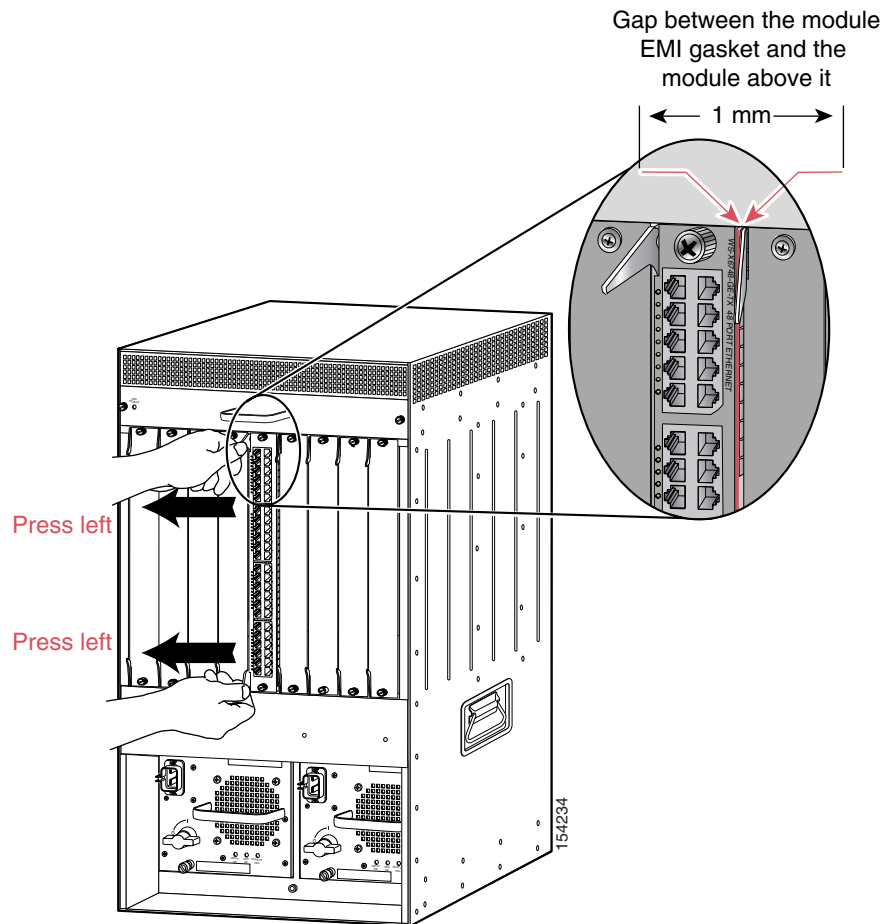
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- f. Verify that the module STATUS LED is lit. Check the STATUS LED periodically. If the STATUS LED changes from orange to green, the module has successfully completed the boot process and is now online. If the STATUS LED remains orange or turns red, the module has not successfully completed the boot process and may have encountered an error.
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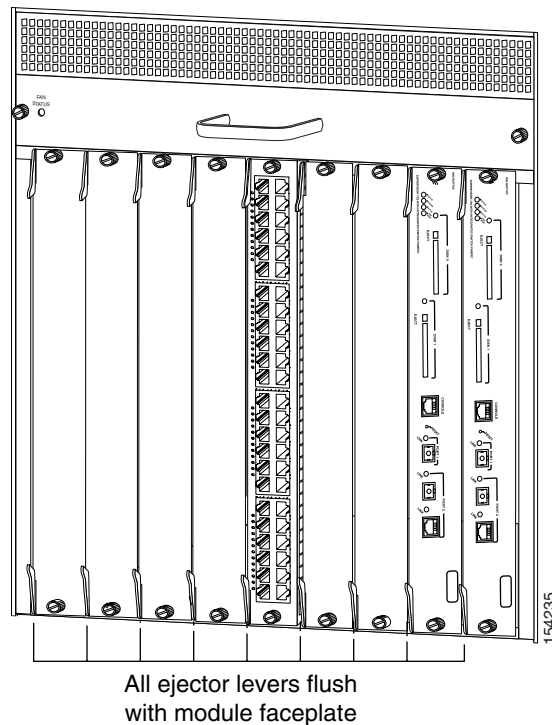
**Figure 26** Positioning the Module in a Vertical Slot Chassis



**Figure 27** Clearing the EMI Gasket in a Vertical Slot Chassis



**Figure 28** Ejector Lever Closure in a Vertical Slot Chassis



## Attaching Your ESD Grounding Strap

Electrostatic discharge (ESD) damage, which can occur when modules or other FRUs are improperly handled, results in intermittent or complete failures. Modules consist of printed circuit boards that are fixed in metal carriers. Electromagnetic interference (EMI) shielding and connectors are integral components of the carrier. Although the metal carrier helps to protect the board from ESD, always use an ESD grounding strap when handling modules.

Follow these guidelines for preventing ESD damage:

- Always use an ESD wrist strap and ensure that it makes maximum contact with bare skin. ESD grounding straps are available with banana plugs, metal spring clips, or alligator clips. All Catalyst 6500 series chassis are equipped with a banana plug connector (identified by the ground symbol next to the connector) somewhere on the front panel. If you have an older Catalyst 6500 series chassis equipped with a plastic banana plug connector, we recommend that you use either the supplied ESD grounding wrist strap (with a metal clip) or an ESD grounding wrist strap equipped with an alligator clip. If you have a newer Catalyst 6500 series chassis that has a bare metal hole as the banana plug connector (also identified by the ground symbol next to the connector), we recommend that you use a personal ESD grounding strap equipped with a banana plug.
- If you choose to use the disposable ESD wrist strap supplied with most FRUs or an ESD wrist strap equipped with an alligator clip, you must attach the system ground lug to the chassis in order to provide a proper grounding point for the ESD wrist strap.



**Note**

This system ground is also referred to as the network equipment building system (NEBS) ground.




- If your chassis does not have the system ground attached, you must install the system ground lug. Refer to the online *Catalyst 6500 Series Switches Installation Guide* for the procedure.



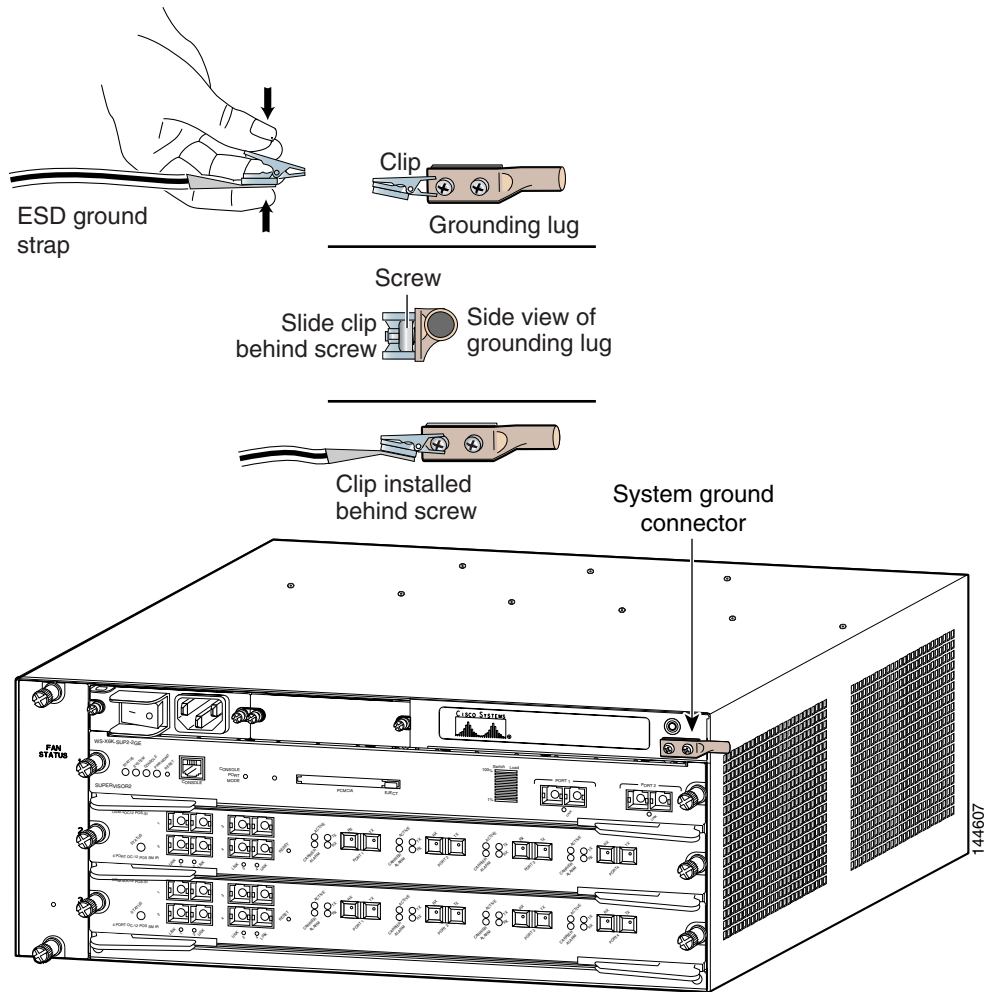
**Note** You do not need to attach a supplemental system ground wire to the system ground lug; the lug provides a direct path to the bare metal of the chassis

After you install the system ground lug, follow these steps to correctly attach the ESD wrist strap:

- 
- Step 1** Attach the ESD wrist strap to bare skin as follows:
- If you are using the ESD wrist strap supplied with the FRUs, open the wrist strap package and unwrap the ESD wrist strap. Place the black conductive loop over your wrist and tighten the strap so that it makes good contact with your bare skin.
  - If you are using an ESD wrist strap equipped with an alligator clip, open the package and remove the ESD wrist strap. Locate the end of the wrist strap that attaches to your body and secure it to your bare skin.
- Step 2** Grasp the spring or alligator clip on the ESD wrist strap and momentarily touch the clip to a bare metal spot (unpainted surface) on the rack. We recommend that you touch the clip to an unpainted rack rail so that any built-up static charge is then safely dissipated to the entire rack.
- Step 3** Attach either the spring clip or the alligator clip to the ground lug screw as follows (See [Figure 29](#)):
- If you are using the ESD wrist strap that is supplied with the FRUs, squeeze the spring clip jaws open, position the spring clip to one side of the system ground lug screw head, and slide the spring clip over the lug screw head so that the spring clip jaws close behind the lug screw head.
- 

**Note** The spring clip jaws do not open wide enough to fit directly over the head of the lug screw or the lug barrel.
- If you are using an ESD wrist strap that is equipped with an alligator clip, attach the alligator clip directly over the head of the system ground lug screw or to the system ground lug barrel.

**Figure 29** Attaching the ESD Wrist Strap Clip to the System Ground Lug Screw



In addition, follow these guidelines when handling modules:

- Handle carriers by available handles or edges only; avoid touching the printed circuit boards or connectors.
- Place a removed component board-side-up on an antistatic surface or in a static shielding container. If you plan to return the component to the factory, immediately place it in a static shielding container.
- Never attempt to remove the printed circuit board from the metal carrier.



For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megohm (Mohm).

## Related Documentation

These documents are available for the Catalyst 6500 series switches:

- *Regulatory Compliance and Safety Information for the Catalyst 6500 Series Switches*
- *Catalyst 6500 Series Switch Installation Guide*
- *Catalyst 6500 Series Switch Cisco IOS Software Configuration Guide*
- *Catalyst 6500 Series Switch Cisco IOS Command Reference*
- *Catalyst 6500 Series DFC Memory Installation Note*
- *Release Notes for Catalyst 6500 Series Switches*

## Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain technical assistance and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

### Cisco.com

You can access the most current Cisco documentation at this URL:

<http://www.cisco.com/techsupport>

You can access the Cisco website at this URL:

<http://www.cisco.com>

You can access international Cisco websites at this URL:

[http://www.cisco.com/public/countries\\_languages.shtml](http://www.cisco.com/public/countries_languages.shtml)

## Product Documentation DVD

The Product Documentation DVD is a comprehensive library of technical product documentation on a portable medium. The DVD enables you to access multiple versions of installation, configuration, and command guides for Cisco hardware and software products. With the DVD, you have access to the same HTML documentation that is found on the Cisco website without being connected to the Internet. Certain products also have .PDF versions of the documentation available.

The Product Documentation DVD is available as a single unit or as a subscription. Registered Cisco.com users (Cisco direct customers) can order a Product Documentation DVD (product number DOC-DOCDVD= or DOC-DOCDVD=SUB) from Cisco Marketplace at this URL:

<http://www.cisco.com/go/marketplace/>

## Ordering Documentation

Registered Cisco.com users may order Cisco documentation at the Product Documentation Store in the Cisco Marketplace at this URL:

<http://www.cisco.com/go/marketplace/>

Nonregistered Cisco.com users can order technical documentation from 8:00 a.m. to 5:00 p.m. (0800 to 1700) PDT by calling 1 866 463-3487 in the United States and Canada, or elsewhere by calling 011 408 519-5055. You can also order documentation by e-mail at [tech-doc-store-mkpl@external.cisco.com](mailto:tech-doc-store-mkpl@external.cisco.com) or by fax at 1 408 519-5001 in the United States and Canada, or elsewhere at 011 408 519-5001.

## Documentation Feedback

You can rate and provide feedback about Cisco technical documents by completing the online feedback form that appears with the technical documents on Cisco.com.

You can submit comments about Cisco documentation by using the response card (if present) behind the front cover of your document or by writing to the following address:

Cisco Systems  
Attn: Customer Document Ordering  
170 West Tasman Drive  
San Jose, CA 95134-9883

We appreciate your comments.

## Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL:

[http://www.cisco.com/en/US/products/products\\_security\\_vulnerability\\_policy.html](http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html)

From this site, you will find information about how to:

- Report security vulnerabilities in Cisco products.
- Obtain assistance with security incidents that involve Cisco products.
- Register to receive security information from Cisco.

A current list of security advisories, security notices, and security responses for Cisco products is available at this URL:

<http://www.cisco.com/go/psirt>

To see security advisories, security notices, and security responses as they are updated in real time, you can subscribe to the Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed. Information about how to subscribe to the PSIRT RSS feed is found at this URL:

[http://www.cisco.com/en/US/products/products\\_psirt\\_rss\\_feed.html](http://www.cisco.com/en/US/products/products_psirt_rss_feed.html)

## Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you have identified a vulnerability in a Cisco product, contact PSIRT:

- For Emergencies only—[security-alert@cisco.com](mailto:security-alert@cisco.com)

An emergency is either a condition in which a system is under active attack or a condition for which a severe and urgent security vulnerability should be reported. All other conditions are considered nonemergencies.

- For Nonemergencies—[psirt@cisco.com](mailto:psirt@cisco.com)

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532



**Tip**

We encourage you to use Pretty Good Privacy (PGP) or a compatible product (for example, GnuPG) to encrypt any sensitive information that you send to Cisco. PSIRT can work with information that has been encrypted with PGP versions 2.x through 9.x.

Never use a revoked or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one linked in the Contact Summary section of the Security Vulnerability Policy page at this URL:

[http://www.cisco.com/en/US/products/products\\_security\\_vulnerability\\_policy.html](http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html)

The link on this page has the current PGP key ID in use.

If you do not have or use PGP, contact PSIRT at the aforementioned e-mail addresses or phone numbers before sending any sensitive material to find other means of encrypting the data.

## Obtaining Technical Assistance

Cisco Technical Support provides 24-hour-a-day award-winning technical assistance. The Cisco Technical Support & Documentation website on Cisco.com features extensive online support resources. In addition, if you have a valid Cisco service contract, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not have a valid Cisco service contract, contact your reseller.

## Cisco Technical Support & Documentation Website

The Cisco Technical Support & Documentation website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day, at this URL:

<http://www.cisco.com/techsupport>

Access to all tools on the Cisco Technical Support & Documentation website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

<http://tools.cisco.com/RPF/register/register.do>



### Note

Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support & Documentation website by clicking the **Tools & Resources** link under Documentation & Tools. Choose **Cisco Product Identification Tool** from the Alphabetical Index drop-down list, or click the **Cisco Product Identification Tool** link under Alerts & RMAs. The CPI tool offers three search options: by product ID or model name; by tree view; or for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

## Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco engineer. The TAC Service Request Tool is located at this URL:

<http://www.cisco.com/techsupport/servicerequest>

For S1 or S2 service requests, or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)

EMEA: +32 2 704 55 55

USA: 1 800 553-2447

For a complete list of Cisco TAC contacts, go to this URL:

<http://www.cisco.com/techsupport/contacts>

## Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—An existing network is down, or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operations are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of the network is impaired, while most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

## Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- The *Cisco Product Quick Reference Guide* is a handy, compact reference tool that includes brief product overviews, key features, sample part numbers, and abbreviated technical specifications for many Cisco products that are sold through channel partners. It is updated twice a year and includes the latest Cisco offerings. To order and find out more about the Cisco Product Quick Reference Guide, go to this URL:

<http://www.cisco.com/go/guide>

- Cisco Marketplace provides a variety of Cisco books, reference guides, documentation, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:

<http://www.cisco.com/go/marketplace/>

- *Cisco Press* publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:

<http://www.ciscopress.com>

- *Packet* magazine is the Cisco Systems technical user magazine for maximizing Internet and networking investments. Each quarter, Packet delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can access Packet magazine at this URL:

<http://www.cisco.com/packet>

- *iQ Magazine* is the quarterly publication from Cisco Systems designed to help growing companies learn how they can use technology to increase revenue, streamline their business, and expand services. The publication identifies the challenges facing these companies and the technologies to help solve them, using real-world case studies and business strategies to help readers make sound technology investment decisions. You can access iQ Magazine at this URL:

<http://www.cisco.com/go/iqmagazine>

or view the digital edition at this URL:

<http://ciscoiq.texterity.com/ciscoiq/sample/>

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:

<http://www.cisco.com/ipj>

- Networking products offered by Cisco Systems, as well as customer support services, can be obtained at this URL:

<http://www.cisco.com/en/US/products/index.html>

- Networking Professionals Connection is an interactive website for networking professionals to share questions, suggestions, and information about networking products and technologies with Cisco experts and other networking professionals. Join a discussion at this URL:

<http://www.cisco.com/discuss/networking>

- World-class networking training is available from Cisco. You can view current offerings at this URL:

<http://www.cisco.com/en/US/learning/index.html>

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